GAS

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT

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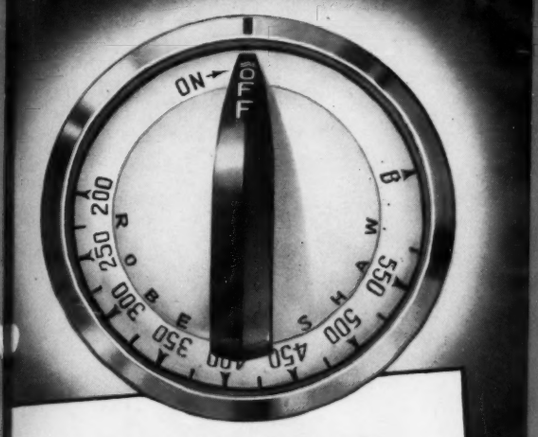
PERIODICAL DIVISION



STUDY THESE FURTHER IMPORTANT FEATURES

Dial combined with double safety plug-type cock, easy to service as an independent gas cock. *(See A in illustration)*

Compact. Easily installed. 48 installation positions.

Bezel keyed to thermostat—rides free of manifold panel.

New, simplified front calibration, by-pass and pilot adjustment. Can be checked with absolute accuracy at room temperature.

Patented non-clog by-pass key. Accurate and dependable on all types of gas, including Butane-Propane. *(See B in illustration)*

Oven valve and thermostat assembly form one unit removable from front without disturbing fittings. Cannot be replaced incorrectly.

Accurate and responsive. Minimum back lash. Co-axial mechanism eliminates lost motion.

Large gas capacity meets all CP requirements.

Patented electric-welded, stainless steel, solderless Diastat. Non-corrosive, over one million in use. *(See C in illustration)*

GREATER CUSTOMER USE OF

OVEN HEAT CONTROL

with the **NEW**

MODEL BJ

ROBERTSHAW

Balanced Beauty Increases Sales Appeal

Gas cock and dial are combined in one unit, operated by one motion. Gas can't be turned on without setting thermostat, nor turned off without bringing it back to off-position. Every oven cooking operation *must* be done with controlled heat. The automatic advantages of the modern gas oven are automatically extended.

The dial is mounted directly on the range manifold, in line with the gas cocks. The front is thus symmetrical, more beautiful.

For the manufacturer this model cuts down assembly time and breakage. For dealers it adds further sales power to a nationally preferred control. For the service department it saves time and money by expediting adjustments.

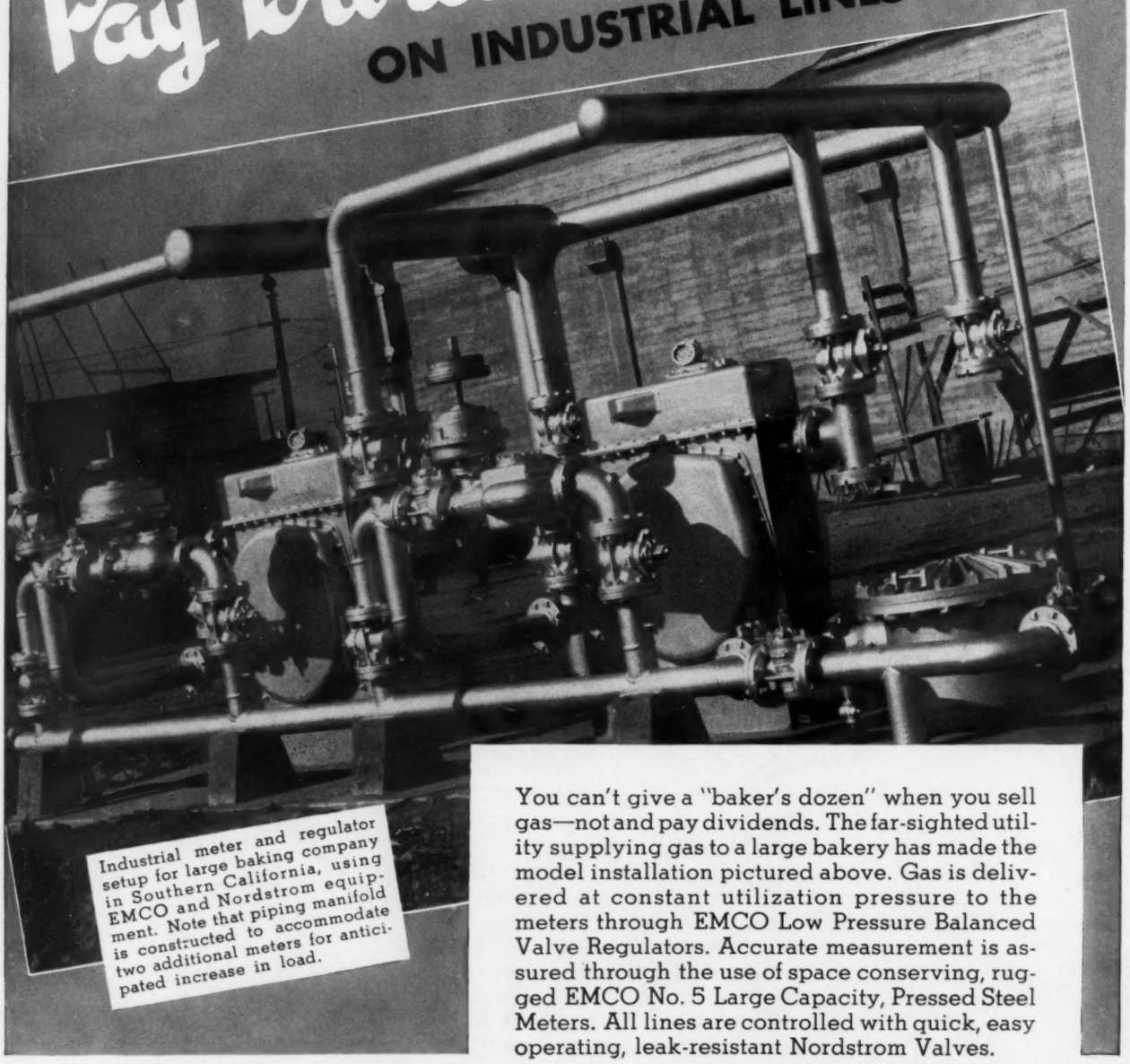
This sales manual tells how to make MORE INCOME FROM GAS RANGES. Crowded with effective sales suggestions: 1939's most widely distributed range sales manual. Help your salesmen increase their earnings: *write for a copy.*

ROBERTSHAW THERMOSTAT COMPANY
YOUNGWOOD, PA.

APRIL 1940 ◆ ◆ 25 CENTS

EMCO METERS AND REGULATORS
NORDSTROM LUBRICATED PLUG VALVES

Pay Dividends
ON INDUSTRIAL LINES



Industrial meter and regulator setup for large baking company in Southern California, using EMCO and Nordstrom equipment. Note that piping manifold is constructed to accommodate two additional meters for anticipated increase in load.

You can't give a "baker's dozen" when you sell gas—not and pay dividends. The far-sighted utility supplying gas to a large bakery has made the model installation pictured above. Gas is delivered at constant utilization pressure to the meters through EMCO Low Pressure Balanced Valve Regulators. Accurate measurement is assured through the use of space conserving, rugged EMCO No. 5 Large Capacity, Pressed Steel Meters. All lines are controlled with quick, easy operating, leak-resistant Nordstrom Valves.

PITTSBURGH EQUITABLE METER COMPANY
MERCO NORDSTROM VALVE CO.

NEW YORK · BUFFALO · PHILADELPHIA
KANSAS CITY · TULSA · LOS ANGELES

Main Offices - PITTSBURGH, PA.

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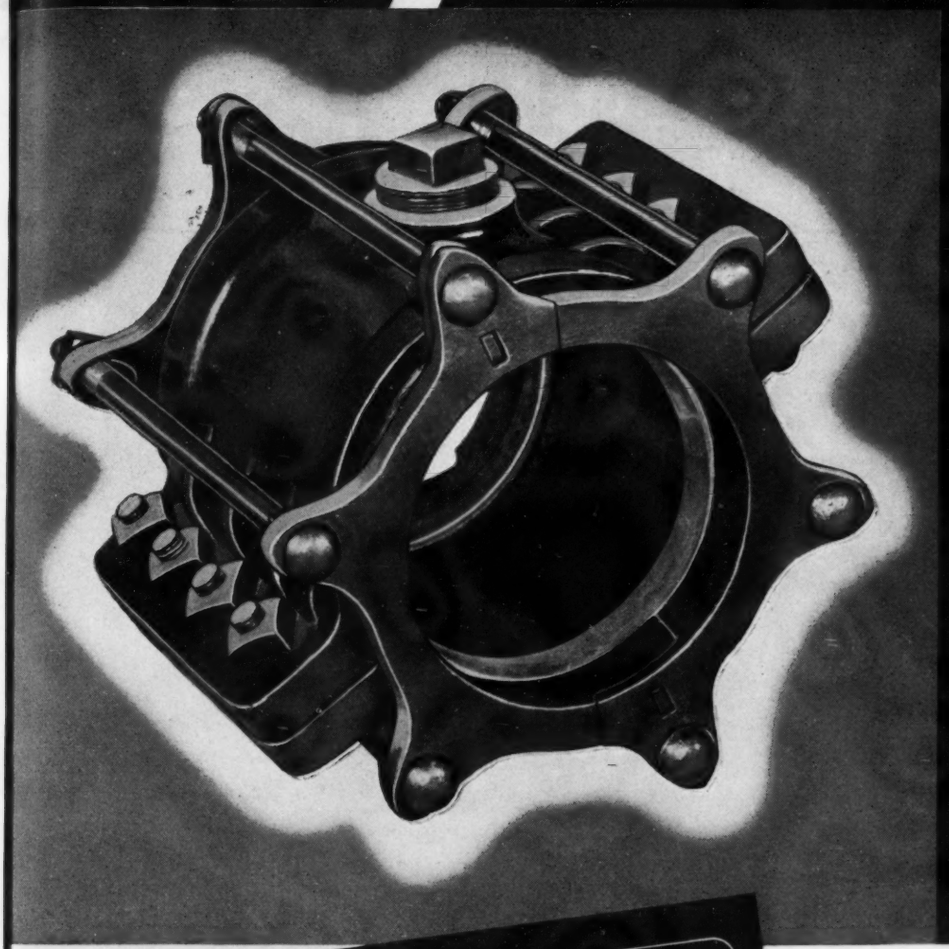
MEMPHIS · OAKLAND · HOUSTON

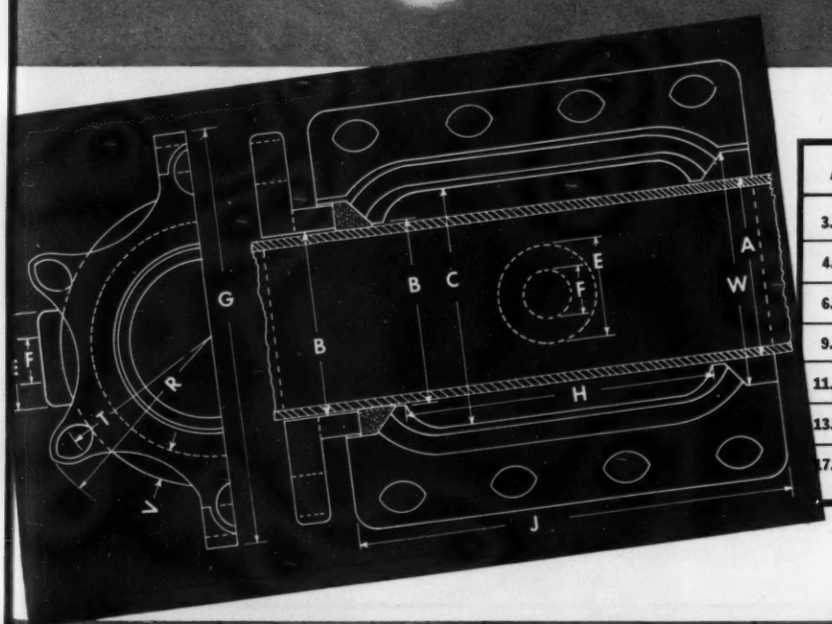
Dayton No. 8-B SPLIT SLEEVE



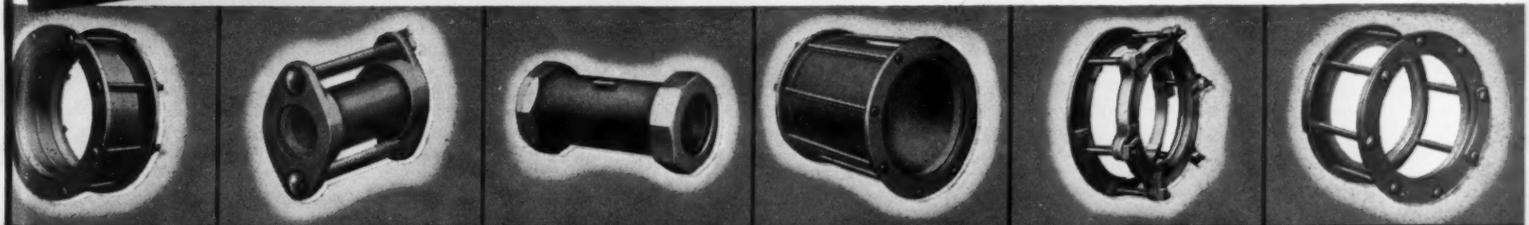
Quickly and efficiently repairs breaks in Cast Iron Mains.

Malleable Iron Center Ring and Flanges give the advantage of lighter construction and contribute to ease of application.

Note the generous dimension of the Center Ring which accommodate coverage of irregular breaks in the pipe (Dimension H).



A	B	C	E	F	G	H	J	R	T	V	W	Boss	No. Sq. In.	Wt. Lbs.
3.80	3.937	4.687	3	2	10.750	6	9¼	9.125	7.625	.375	5.312	0		
4.80	4.937	5.687	3	2	11.750	6	9¼	10.062	8.500	.375	6.312	0	1350	63
6.90	7.031	7.812	4	2½	13.750	6	9¼	12.312	10.750	.375	8.312	30	1500	71
9.05	9.187	9.812	4½	3	16.000	6	9¼	15.500	13.937	.375	10.562	30	600	98
11.10	11.250	11.750	4½	3	18.062	7	10¼	16.812	15.125	.437	12.625	0	850	128
13.20	13.343	13.843	5½	4	20.343	8	11¼	18.812	17.250	.437	14.718	0		145
17.40	17.562	18.062	5½	4	24.562	10	13¼	23.125	21.437	.437	18.937	18		184



"Dayton" for Every Type of Coupled Line

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GAS

REG. U. S. PATENT OFFICE

Sixteenth Year of Publication

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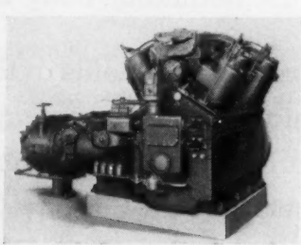
COOPER-BESSEMER "TWINS" FURNISH POWER FOR NORTHERN NATURAL'S NEW STATION

Again the gas industry progresses! . . . this time with Cooper-Bessemer horizontal compressors! Northern Natural Gas Company's new South Sioux City station contains Type 19 twin-cylinder units, each delivering 800 hp at 180 rpm . . . duplicates of the ones shown above in their Ventura, Iowa, station. These slow-speed, long-life Type 19's form another link in the chain of hundreds which stretches from coast to coast.



. . . and If You Like "Angle" Units, There's the Compact Type G-MV!

Built in 4, 6 and 8-cylinder sizes, rated 400 to 800 hp, these modern "V-and-Angle" compressors combine ruggedness with compactness . . . foundations and housing cost less, they transport easily, install quickly . . . oil-cooled pistons and precision bearings are among their many features.

Write for Bulletins

THE COOPER-BESSEMER CORPORATION

640 EAST 61st STREET . . . LOS ANGELES, CALIFORNIA

25 West 43rd Street, New York City Mills Building, Washington, D. C. 631 Spring St., Shreveport, Louisiana 201 East 1st St., Tulsa, Oklahoma
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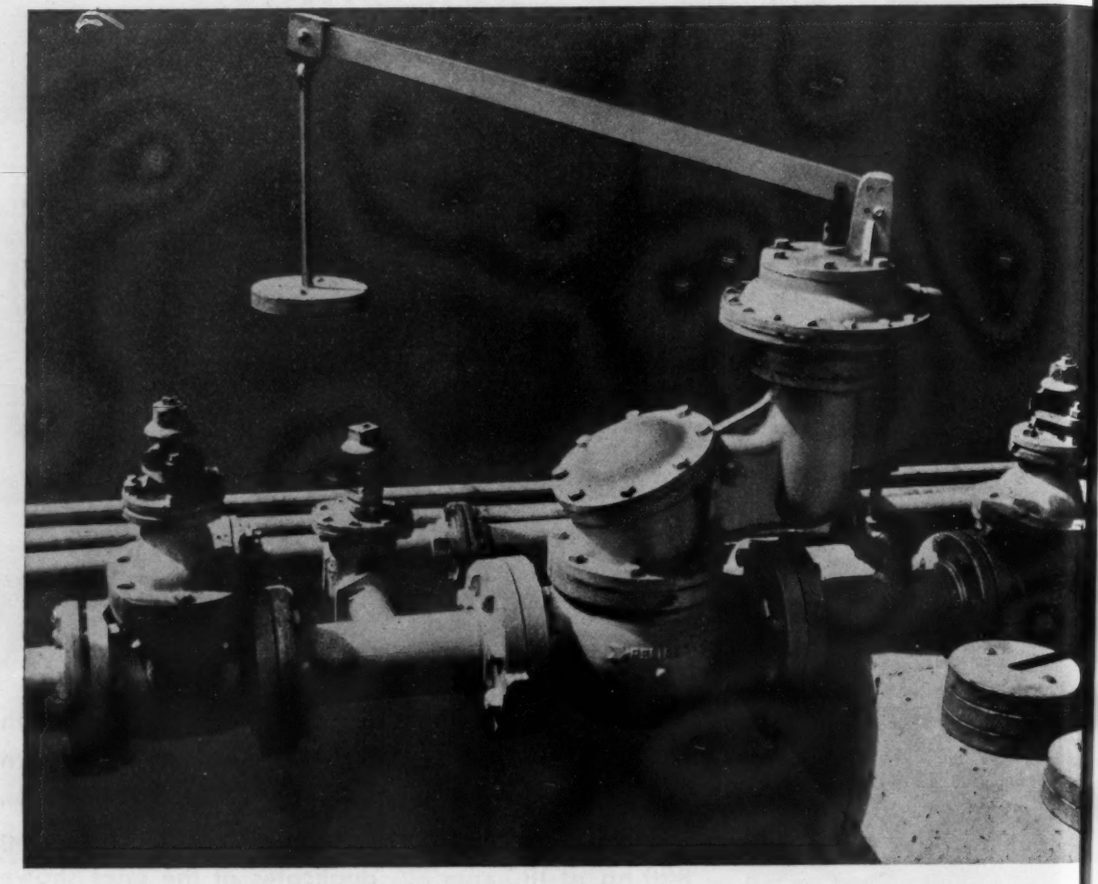
RELY ON Reliance FOR PERFECT CONTROL OF ANY GAS.....



REGULATORS YOU CAN RELY ON — RELIANCE — SINCE 1910

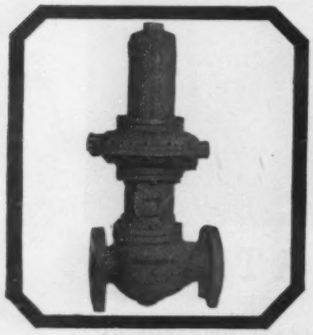
Reliance Regulators give safety, satisfaction, economy...wherever they are used.

SAFETY, by providing positive shut-off of normal or emergency pressures, protecting appliances inside the property line.

SATISFACTION, by insuring efficient combustion at uniform outlet pressures at all loads throughout the capacity range.

ECONOMY, by accessibility of valve seat discs that can be repaired or replaced without taking the Regulator body off the line.

Get all three benefits at the same time—safety, satisfaction and economy—by using Reliance Regulators for distribution, industrial and domestic control of any fuel gas.

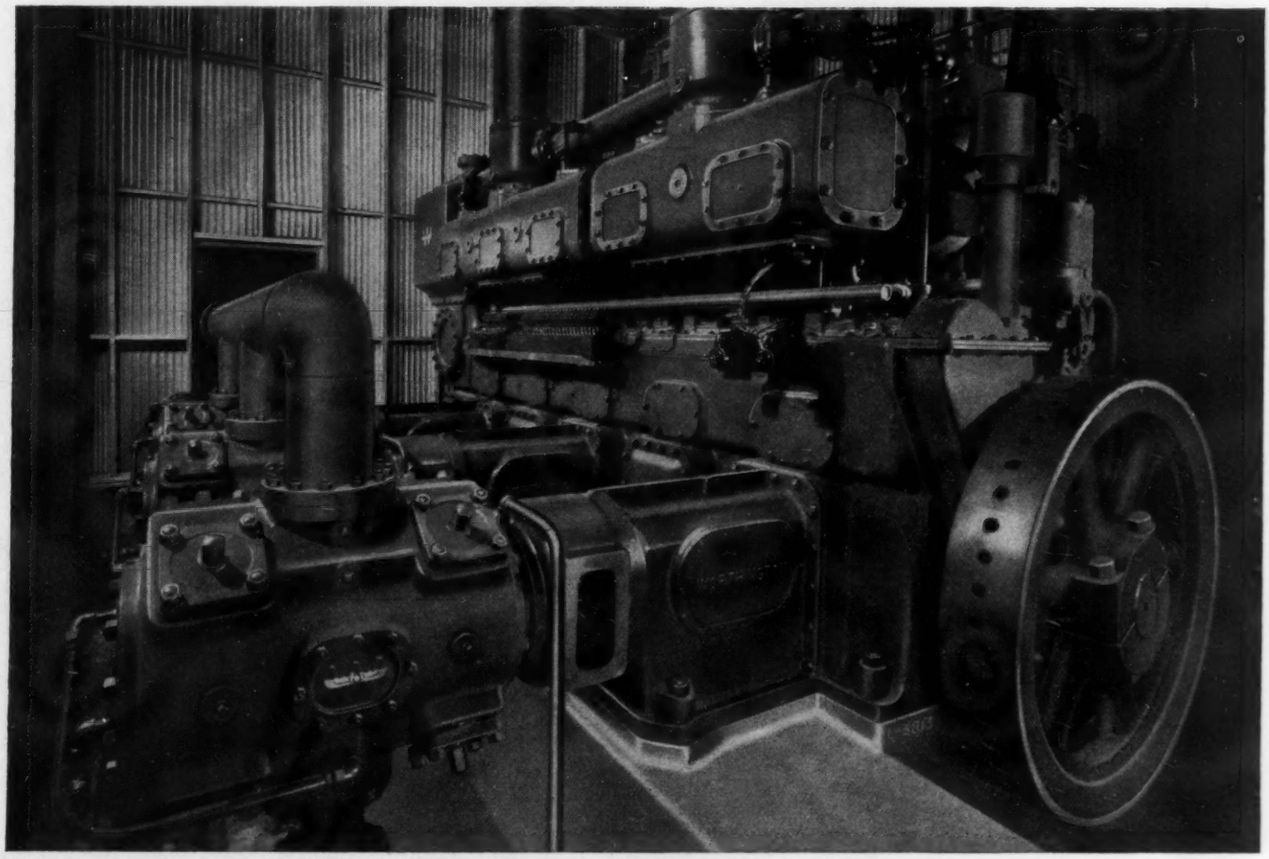


Reliance Type CBV Direct Connected Regulator

Reliance Type CBV Offset Connected Regulator

RELIANCE REGULATOR CORPORATION
1000 MERIDIAN AVE., ALHAMBRA, CALIFORNIA

RELIANCE REGULATORS



WORTHINGTON ANGLE GAS ENGINE COMPRESSOR

Two cycle - - Type LTC

A few of the prominent features that make this unit OUTSTANDING

- **6 sizes available, from 3 to 8 cylinders, ranging from 375 hp. to 1000 hp.**
- **Exceptionally good fuel economy.**
- **Removable wet-type liner in power cylinders permitting uniform cooling and free expansion . . . longer life and low cost replacement.**
- **Maximum accessibility of all moving parts.**
- **Vertical double-acting crosshead type scavenging pump located at end of engine . . . affording easy accessibility.**
- **Efficient oil-cooled power pistons resulting in low cylinder temperature and more effective lubrication.**
- **Gear-driven camshaft eliminates maintenance and attention.**
- **Extra large bearings and pins resulting in low bearing pressures and temperatures.**
- **Complete force-feed lubrication of all moving parts.**
- **Completely water-cooled exhaust manifold.**
- **Twin-ignition optional and readily applied.**

See Our Exhibit
INTERNATIONAL PETROLEUM EXPOSITION
TULSA
MAY. 18-25

A type LTC unit will be on display . . . and in operation . . . in the Worthington exhibit at the International Petroleum Exposition.

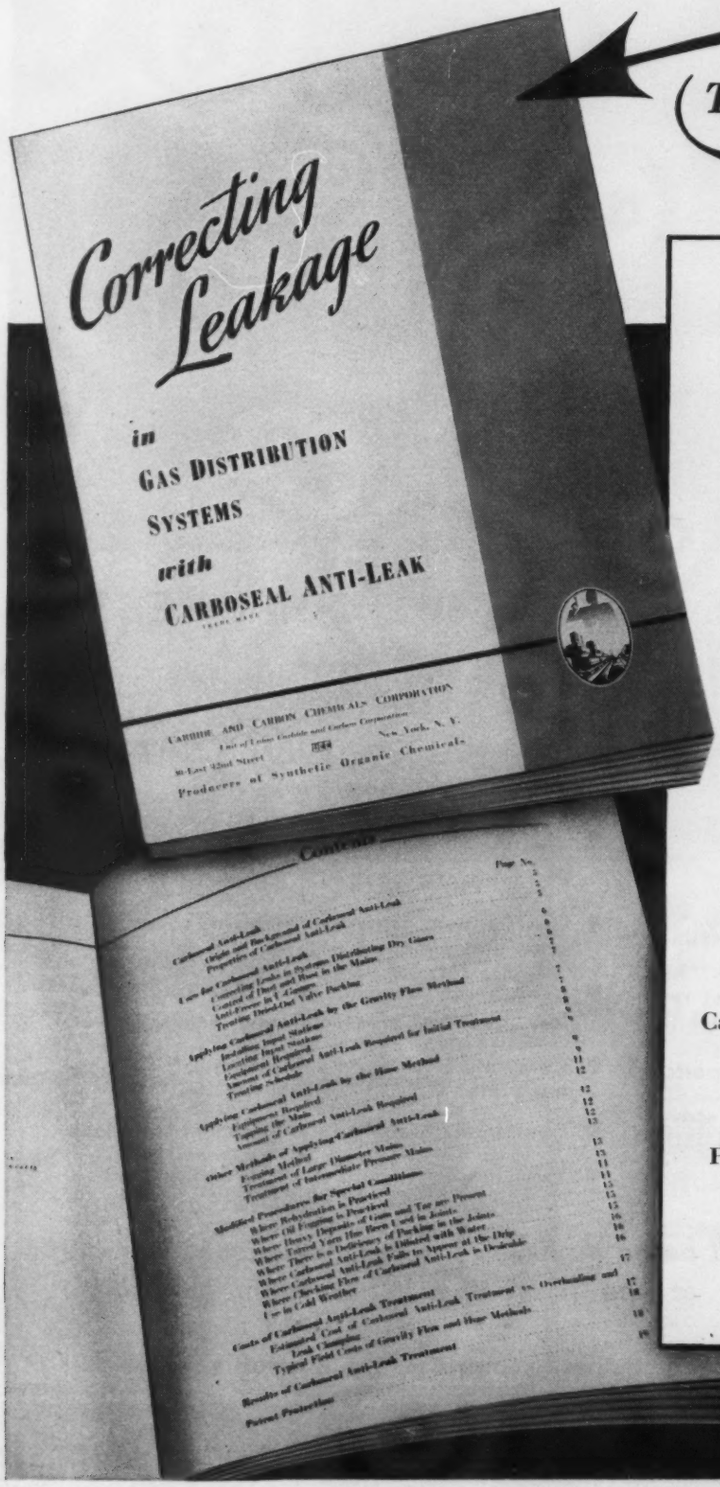
Bulletin L-600-B10, describing these compressors, is available on request

WORTHINGTON PUMP AND MACHINERY CORPORATION

General Offices: **HARRISON, NEW JERSEY** • *Offices and Representatives in Principal Cities*

ECO-2

LEAKAGE in Dry Bell-and-Spigot Joints can be corrected at LOW COST!



This New Book Tells How!

THIS book is full of information about "Carboseal" anti-leak, the scientifically developed liquid for correcting bell-and-spigot joint leakage in distribution systems carrying dry manufactured or natural gas. It incorporates in compact form all the essential facts about "Carboseal" anti-leak, the methods of application, comparative costs, and results obtained.

The use of "Carboseal" anti-leak has now become a routine procedure in the maintenance programs of 250 gas companies. Their experience indicates that the average cost of "Carboseal" anti-leak is $90 per mile of 3-in. equivalent main.

Send for this book. Possibly this inexpensive and economical method of correcting joint leakage can be used to advantage in your system. A request on your company letterhead will bring you a copy, without obligation.

The word "Carboseal" is a registered trade-mark of Carbide and Carbon Chemicals Corporation.

Carbide and Carbon Chemicals Corporation

Unit of Union Carbide and Carbon Corporation

UCC

30 East 42nd Street, New York, N. Y.

Producers of Synthetic Organic Chemicals

THE MYSTERY* OF THE FLUTTERING DISC

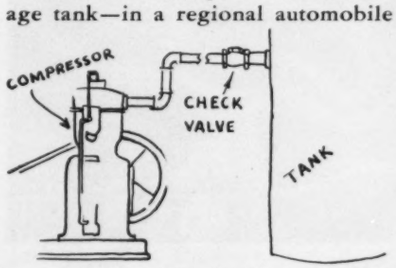
SOLVED WITH PREVENTIVE MAINTENANCE

"Why in blazes," asked the SUPER., "does that air compressor run all the time for a part-time job?"

"For the love of Mike," said the P. A. "This is the fourth time we've replaced that air line valve."

"This looks like a case for Preventive Maintenance," said the CRANE REPRESENTATIVE. "And Crane can supply the check valve you really need."

THIS conversation between the Superintendent, the P. A. and the Crane man isn't on record, but the facts are: The installation was a simple one as the sketch here shows: a common swing check valve in an air line, between compressor and storage tank—in a regional automobile



assembly plant. But, the valve wouldn't hold tight—it required much too frequent replacement. And in the meantime, the compressor panted along, doing twice the work it needed to —for those swing checks started leaking long before they actually gave up the ghost.

Ordinary maintenance would have again replaced like with like. But the Superintendent saw that Preventive Maintenance—as suggested by W. F. W., the Crane salesman, was necessary. It counseled stopping the trouble at the source: eliminating a valve in which the disc could flutter itself to pieces in the pulsating flow of air from the compressor, replacing not with another swing check valve, but with a cushioned disc check valve.

Results: (1) No further replacements even after five years, (2) a tight valve that holds air, keeps the compressor inactive except when service uses demand air, (3) one more manufacturer who has learned the economy of Preventive Maintenance and of looking to the Crane line for just the right valve for the job —of looking to the Crane salesman for the information needed for correct valve application.

* *This case is based on an actual experience of a Crane Representative in our Chicago branch.*

PREVENTIVE MAINTENANCE COUNSELS

Crane Cushioned Disc Check Valves

In any service—steam, water, air, oil or gas, where pulsation is severe, these Crane piston disc check valves will absorb the damaging effects of the flow. A dashpot formed above the piston effectively cushions the disc with each pulsation. For pressures up to 300 pounds steam at 550°, your best bet is this Crane 366E with both body and disc of Crane Hard Metal —a copper-tin bronze of high wear-resisting quality. Can be reground without removing body from line. In sizes up to 3"—with screwed or flanged ends. See page 36 of your Crane No. 52 Catalog.

1940 OUR 85th YEAR

CRANE

CRANE CO., GENERAL OFFICES
836 S. MICHIGAN AVE., CHICAGO

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

How to Simplify, Speed Up, and Safeguard Your Work on Services

Because the new Dresser SUPER SERVICE Fittings have been developed *feature by feature* to effect service connections readily under the most troublesome operating conditions, they automatically *simplify* and *speed up* your service work. Because they also incorporate *plus* margins of strength and tightness throughout, they *safeguard* uninterrupted service after installation. The following reasons explain why:

ALL THESE ADVANTAGES!

1. Easy assembly on pipe already deflected; 2. Ample, *wedge-shaped* gaskets** and plenty of "take-up" of nut on body provide *reserve sealing power* for positive tightness, both on corroded or deflected pipe; 3. "Stab" fit eliminates necessity for disassembly before installation; 4. Exclusive, *cup-shaped* gasket-retainer ring confines and automatically centers itself on gasket, preventing nut from fouling on gasket, with consequent false sense of tightness; 5. Ruggedly constructed throughout; 6. Fully flexible; 7. Anyone can install, on plain-end pipe, using only a wrench, even under adverse ditch or weather conditions, with complete safety, and without need for exact pipe lengths; 8. Long pipe entrance afforded; 9. Connection is union-type; 10. Can be salvaged for re-use.

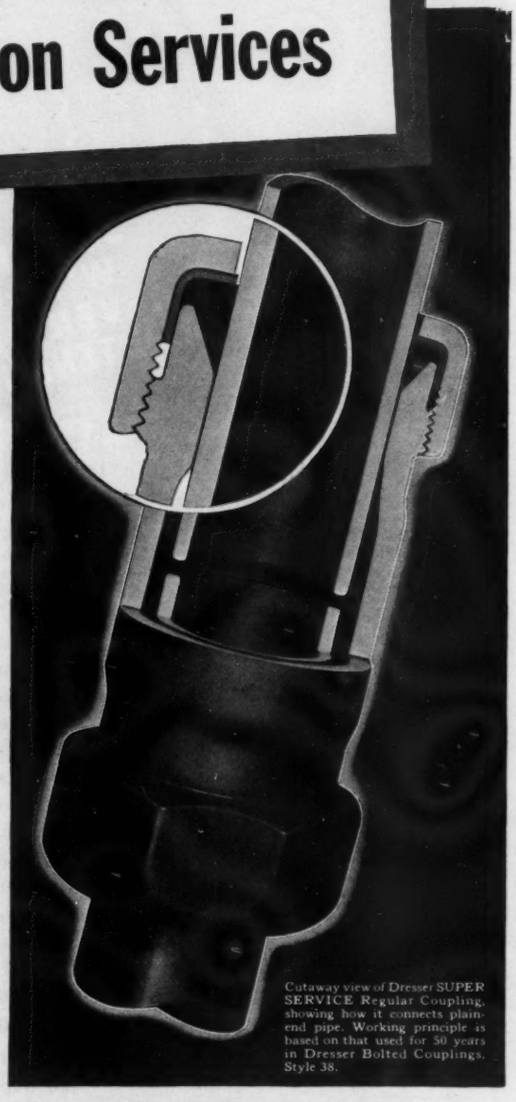
SEND FOR FREE SAMPLE

and 16-page catalog. No obligation. Give pipe ID and fitting* desired.

DRESSER MANUFACTURING CO., BRADFORD, PA. *New York:* 17 East 42nd Street; *Chicago:* Peoples Gas Building; *Houston:* Shell Building; *San Francisco:* 1038 Polk Street; *In Canada:* Dresser Manufacturing Company, Ltd., 60 Front Street, West, Toronto, Ontario.

*See illustration in panel below of various fittings in the Dresser SUPER SERVICE line.

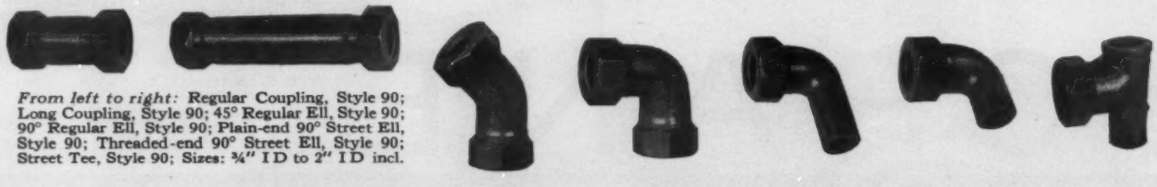
**Gaskets used in SUPER SERVICE Fittings, Style 90, are same shape as those in famous Dresser Bolted Couplings, Style 38. Can be supplied in plain Grade 27, plain Grade 29, Armored Grade 27, duck-tipped Grade 27, and lead-tipped Grade 27.



Cutaway view of Dresser SUPER SERVICE Regular Coupling, showing how it connects plain-end pipe. Working principle is based on that used for 50 years in Dresser Bolted Couplings, Style 38.

Dresser SUPER SERVICE Fittings

(Style 90)



From left to right: Regular Coupling, Style 90; Long Coupling, Style 90; 45° Regular Ell, Style 90; 90° Regular Ell, Style 90; Plain-end 90° Street Ell, Style 90; Threaded-end 90° Street Ell, Style 90; Street Tee, Style 90; Sizes: ¾" ID to 2" ID incl.

NO PIPE WAS EVER MEANT TO STAND SUCH PUNISHMENT!

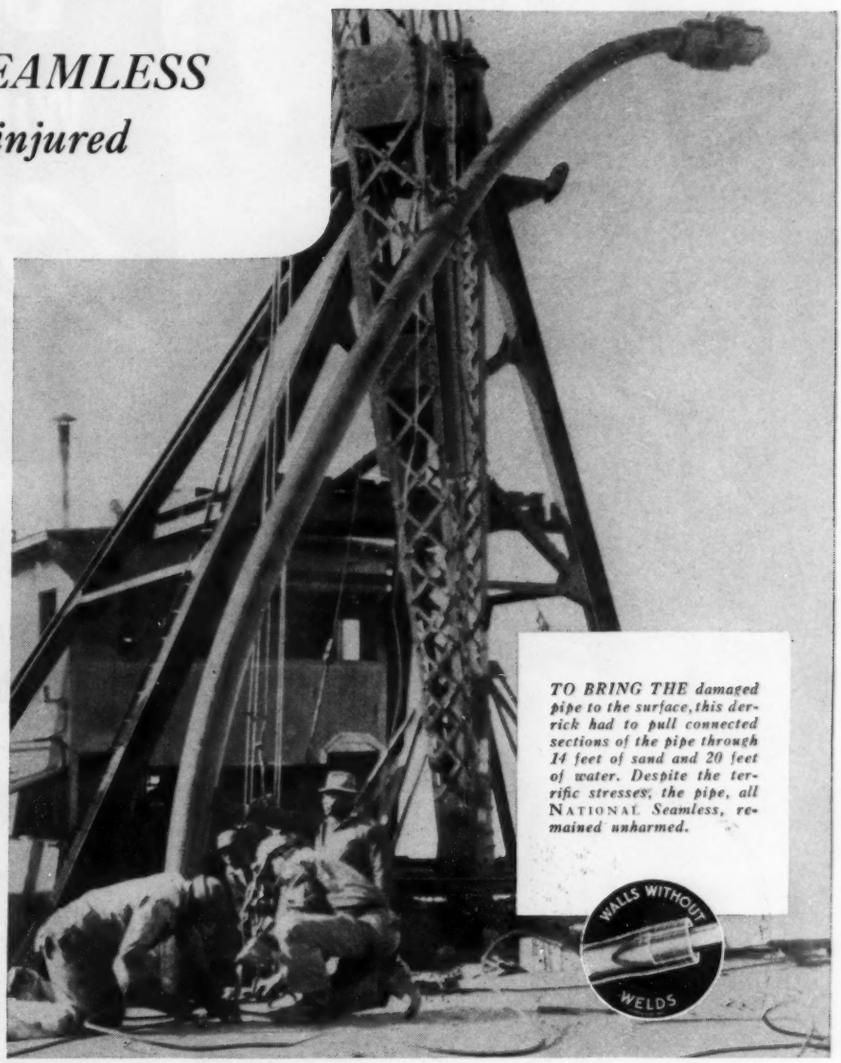
Yet NATIONAL SEAMLESS came through uninjured

ONE of the most remarkable tests of pipe stamina ever recorded is the story of a gas line crossing the Mississippi River near Onward, Miss., part of the system of Southern Natural Gas Company.

Constructed of NATIONAL Seamless Pipe (10¾" O.D. x ½" wall), this crossing was originally covered by several feet of sand. However, a change in the river current exposed one section of the pipe. It was struck and ripped open by the propeller of a large river boat.

How to repair the break and restore service as quickly as possible? That was the question which faced the operators of the line. They decided upon the most direct method. They would try to lift the pipe bodily to the surface.

A barge-mounted derrick was rushed to the scene and anchored in position. With this source of power, they seized the exposed ends and literally stripped the pipe from the bottom of the river, carrying along sections buried under *14 feet of sand and 20 feet of water.* Despite the terrific strain imposed by the method of removal, the pipe was uninjured. Repairs were quickly completed, tested, and the pipe restored to safety, well below the river bed.



TO BRING THE damaged pipe to the surface, this derrick had to pull connected sections of the pipe through 14 feet of sand and 20 feet of water. Despite the terrific stresses, the pipe, all NATIONAL *Seamless, remained unharmed.*

This is another instance showing how NATIONAL Seamless, like a thoroughbred champion, can "take it." Each length of this pipe is an homogeneous cylinder, pierced from a billet of finest quality steel, with no welds— no lines of potential weakness—"Walls Without Welds."

Wherever you want safe operation at high pressures, and maximum protection against the unexpected, use NATIONAL Seamless Pipe.

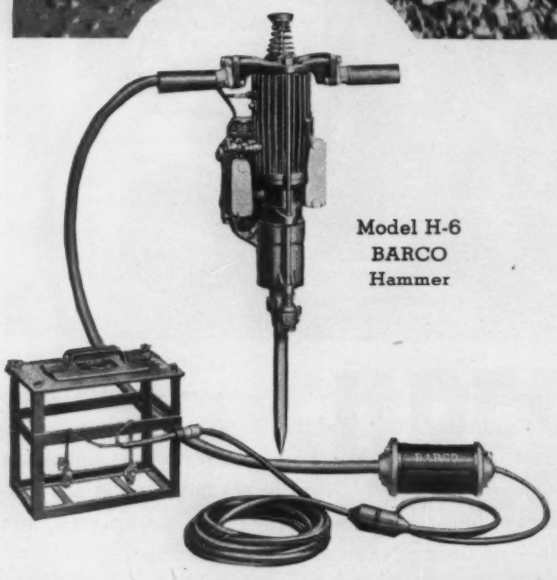
NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Export Company, New York

UNITED STATES STEEL

When Jobs Pile Up BARCOs Will Help You *Stay on Top!*



Model H-6
BARCO
Hammer

Portable BARCO Hammers Let You Work On As Many Widely Separated Jobs As You Have Hammers

● What does your maintenance department do when faced with more emergency and routine jobs than it has heavy hammer outfits? Put off the routine work? Turn to time-wasting "pick-and-shovel" methods? Not if BARCOs are on the equipment list. Here are portable, versatile hammers that are "self-powered." One man and a BARCO—without auxiliary equipment—can rush to a job—and often finish up before arrival of a heavy outfit. Add to this stamina, low operating cost, small initial investment and you have an indispensable tool for the utility work chest. Let us demonstrate a BARCO, soon.

BARCO MANUFACTURING CO.
1830 Winnemac Avenue, Chicago, Illinois

BARCO *Portable* GASOLINE HAMMER

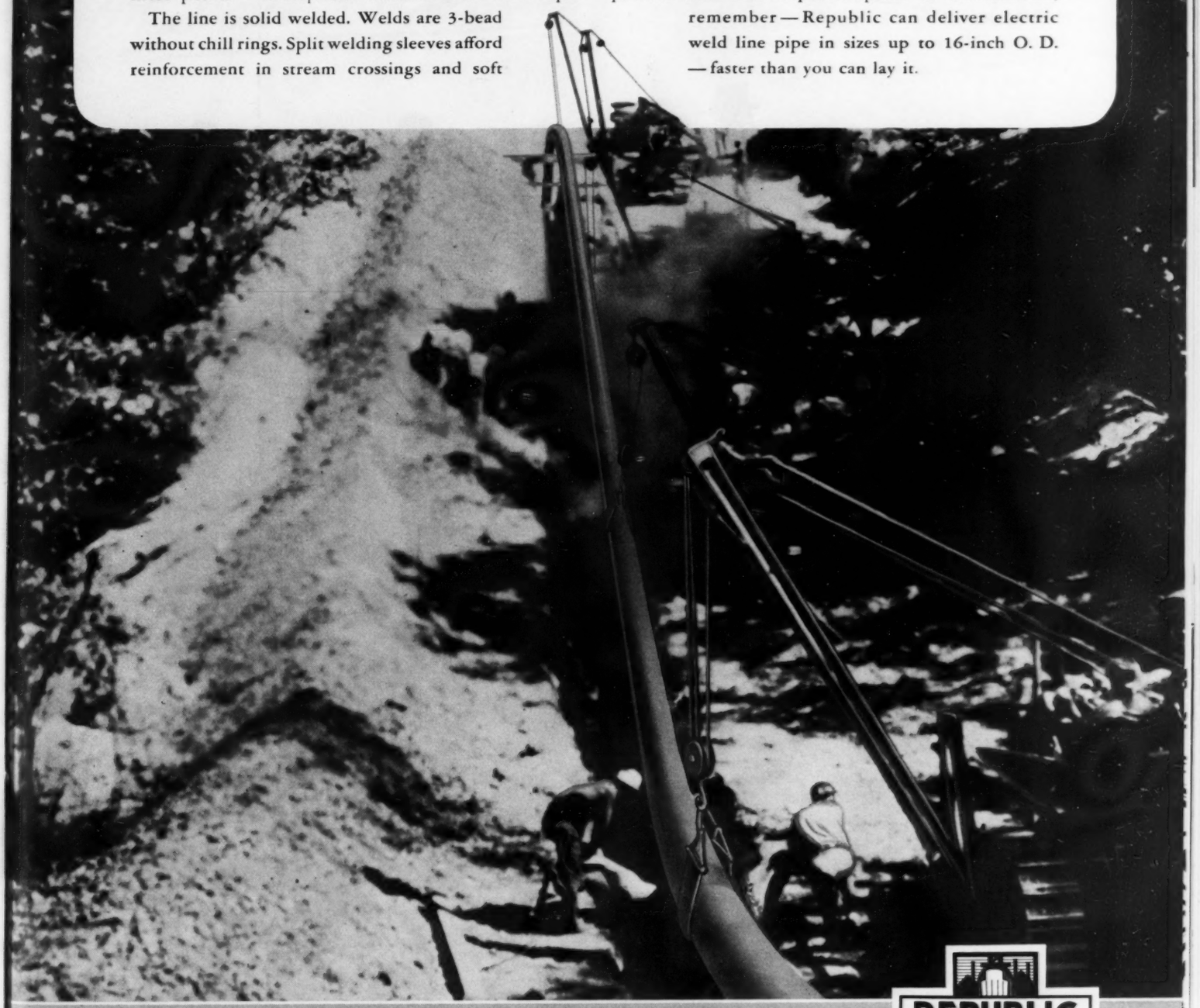
Republic Electric Weld Line Pipe

IN NORTHERN NATURAL GAS LINE FROM SIOUX CITY TO MINNEAPOLIS

Much of the pipe in the recently completed addition to the Northern Natural Gas System — 243 miles of 16-inch line from Sioux City, Iowa, to Minneapolis, Minn., with distribution lines to communities between these points — is Republic Electric Weld Line Pipe.

The line is solid welded. Welds are 3-bead without chill rings. Split welding sleeves afford reinforcement in stream crossings and soft spots. Double random lengths of pipe were welded into three- to five-joint sections, then tied in over the ditch. Only three months were required to complete the project.

And that brings up this thought. If you contemplate a line that requires speed in construction, remember — Republic can deliver electric weld line pipe in sizes up to 16-inch O. D. — faster than you can lay it.



Republic Electric Weld Line Pipe — Clean Inside — No Scale — Round — Uniform in Wall Thickness — Welds Readily — and Comes in Long Lengths.

REPUBLIC STEEL
REG. U. S. PAT. OFF.

REPUBLIC STEEL CORPORATION

General Offices • • • Cleveland, Ohio

BERGER MANUFACTURING DIVISION
NILES STEEL PRODUCTS DIVISION
STEEL AND TUBES DIVISION
UNION DRAWN STEEL DIVISION
TRUSCON STEEL COMPANY

LAYING PIPE IN ZERO WEATHER

Application—Barrett Enamel. Panhandle Eastern Pipe Line Co.

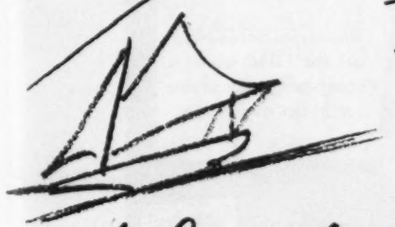
PANHANDLE EASTERN PIPE LINE COMPANY'S construction program this year demands out-of-season work under adverse winter conditions. But Barrett Enamels, designed to overcome unusual obstacles, performed faultlessly. Not a foot of pipe . . . no coatings on Dresser couplings, lost because of cold weather. Again Coal-Tar Pitch, of which Barrett Enamels are made, proves itself the most stable of known bituminous substances. And again Barrett skill in manufacturing and careful Barrett supervision in the field illustrate two of the many reasons farsighted engineers specify Barrett Enamels.

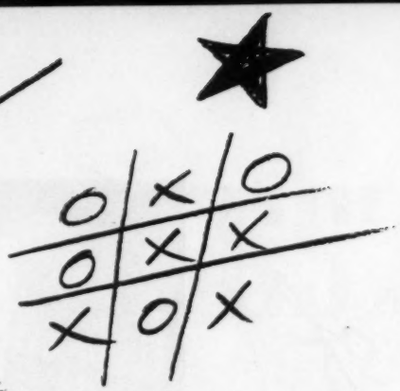
THE BARRETT COMPANY, 40 Rector Street, New York, N. Y.

Barrett
PIPELINE
ENAMEL

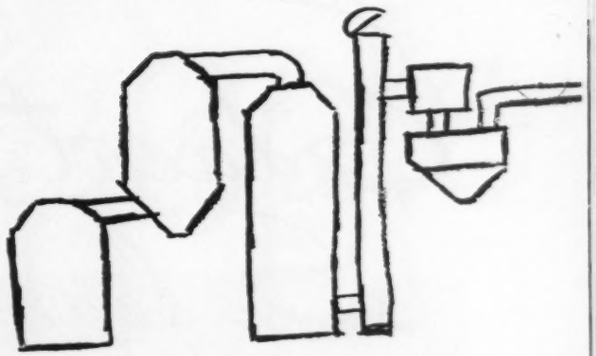
BARRETT SERVICE With Barrett Field Service assistance and rigid inspection, The Barrett Company provides a unique follow-through to assure the best possible results from Barrett protective coatings. Inquiries are invited.

Coal Bowling Green 9.3536





Sweet Solvay Reverse Flow



What about Heavy Oil?

535 Btu Gas

Former Coals

28.0 # Generators Fuel @ 7.0 NT = $.0980
2.75 gals Gas Oil @ $.05 = .1375
$.2325

Tax Credit 12% =
.33 gal @ .05 = .0165
.2160
Fuel & Oil less Tax .1428
.0732 Savings

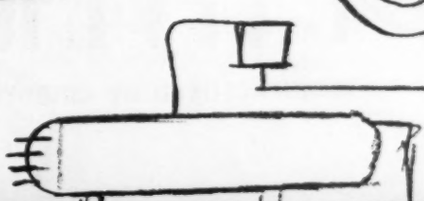
With Heavy Oil

14 # @ 7.00 = .1049
4.7 gals HO @ .026 = .1232
.1722

25% = 1.175 gal @ .025 = $.0294
.1428

Get Sweet Solvay man in again to check on

Water Cooler
Decanter
Demulsifier
Purifiers

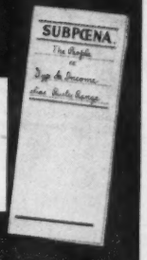


Education of Salesmen . . .

THE MOST IMPORTANT FACTOR IN SUCCESSFUL CP PROMOTION

The true story of the modern gas range, properly interpreted to Mrs. Homemaker is the vital link in modern CP Gas Range merchandising. Education of retail salesmen is the one essential element of any sales program that is based on selling the merit of the product—where reasonable profit per unit sold is desired and in which "cut price" is not the main magnet to attract prospects. Universal for 1940 is glad to undertake the training and education of retail gas range sales organizations, with the assurance that years of experience qualify Universal to adequately fulfill the obligation implied by the promise of—"education of the salesmen."

Universal Sales Manual for 1940 gives a complete story of the modern gas range.



Subpoena Notice—constitutes a unique method of notifying salesmen of sales meeting.

A special Salesmen's Newspaper intended for distribution during period of sales meeting

A Broadside for salesmen that reviews the sales presentation.

A series of Six Broadsides designed for mailing direct to salesmen's homes—contains pertinent facts regarding the complete service rendered Mrs. Homemaker by the modern Universal gas range.

THE UNIVERSAL PROGRAM FEATURES EDUCATION OF SALES PERSONNEL

Realizing the importance of proper and adequate education of sales personnel, particularly in CP Gas Range promotion, Universal for 1940 has designed the most comprehensive educational program ever presented the gas range industry. This program comprises Sales Manual, Salesmen's Newspaper, Meeting Notices, and a complete series of Educational Salesmen's Broadsides.

UNIVERSAL *Gas Ranges*

MANUFACTURED BY CRIBBEN AND SEXTON CO. • 700 N. SACRAMENTO BLVD. • CHICAGO, ILL.

GAS
APRIL, 1940

GUEST Editorial

By B. T. FRANCK
Vice-President, Sales and Service
Milwaukee Gas Light Company

In Behalf of Gas Refrigeration

AS chairman of American Gas Association's Refrigeration Committee, I bespeak a word in behalf of its 1940 activities.

In stressing the importance of refrigeration to the gas industry, it has been pointed out repeatedly that the gas refrigerator protects the domestic cooking load. This modest claim tells only half the story. The other half is that it is the only gas appliance which *directly* protects the domestic cooking load *and increases gas consumption in doing so.*

Other gas appliances may safeguard the cooking load and increase consumption, but their influence is largely indirect; they are not a part of the kitchen furnishings. Kitchens which have a gas refrigerator but not a gas range are a rarity.

For the over-all good of the gas industry, it is the underlying aim of the 1940 A.G.A. Refrigeration Committee to make substantial progress in augmenting the sales effort behind the gas refrigerator through the following channels:

1. To inspire all companies selling gas to make gas refrigerator sales a year round, specialty selling enterprise with adequate attention focused on the replacement market.

2. To persuade straight gas companies to examine their rate structures and, where advisable or necessary, inaugurate a gas rate which is favorable to the acquisition of the refrigeration load.

3. To likewise persuade combination utilities to give further consideration to the sale of gas refrigerators. In recent years a number of state regulatory bodies have ordered the separation of gas and electric investments of combination utilities and each division, from a standpoint of earnings, has been compelled to stand on its own feet, as it were. In many such cases the electric departments have reached the uppermost limits of their allowable earnings under the law.

Because the gas refrigerator is such an outstanding performer, it may be that the only thing which prevents it from giving the customer the most refrigeration service for his money is the need of a gas rate which is favorable to the development of a substantial gas refrigeration load. Perhaps a special refrigeration rate may enable the combination utility to build up the return on its gas investment without impairing the income on its investment in electric facilities.

The big 1940 A.G.A. Refrigeration Campaign, "Pioneers of Progress," symbolized by the Flying Clipper Ship which has opened up new horizons in transportation, is prophetic of what the gas industry can accomplish in establishing new horizons in the refrigeration field when every utility, both straight gas and combination, lends its sustained and vigorous support to this venture.

The industry's predominant use of American Meter Company meters is of course based essentially on their performance records. • And these quality standards . . . made possible through progressive experience of more than a century in gas meter development . . . are insured only by the rigid laboratory control and precision methods maintained throughout every operation and stage of manufacture.

THERMALLY *Thinking*

The Utility Taxpayer

The Consolidated Edison Co. of New York gave the entire industry an excellent lead with its series of newspaper advertisements last year, calling the public's attention to its civic status as a taxpayer and just what its taxes amounted to in terms of New York City's tax-borne public services. And mind you, there were state and federal taxes also, making the total tax a new high record of $54,320,798 equivalent to $4.77 a share on the common stock or 67.6 per cent of the total paid employes for wages, pensions, etc.

The city taxes paid by the Consolidated Edison Co., according to its annual report, make it the city's largest taxpayer and "are sufficient to meet almost 50 per cent of the cost of police protection, or 89 per cent of the cost of fire protection, or 240 per cent of the cost of parks and museums, or 103 per cent of the cost of the department of sanitation, or 19 per cent of the cost of the public schools, or over 100 per cent of the cost of operating the city's hospitals."

No wonder many New Yorkers, who can think beyond the sound of a demagogic politician's voice, are more and more appreciating *from all angles* the value of private utility service operating under public regulation.

An Attitude of Open-Mindedness

Self examination of a constructive but none the less sharply critical nature has become more and more the keynote of the gas industry's leadership. Much has been said of the industry's ability to adapt itself to mechanical and market changes in the past. The swing from gas as basic fuel for illumination only, to domestic cooking, then to house heating and water heating, and on to the conception of gas as a fuel for every domestic purpose has been accomplished with a minimum of disruption of the industry itself, and with (almost, at least) a maximum of efficiency to the consumer.

But the new trend in executive and in association thought and discussion goes much further than just the superficial aspects of the market itself. Fundamental, political, social and economic changes are now in focus. The Consumer Movement, taxation policies, the relation between rate structures and mass purchasing power occupy an ever-increasing attention.

Indignation and invective are forgotten as reasoned considerations are brought to bear on the new problems presented. This attitude of open-mindedness, so well exemplified in the papers and discussions before the New England Gas Association, is the industry's greatest guarantee that social and economic change can be met and assimilated in the climaxing 1940's, as readily as market and mechanical changes were in the decades that followed the turn of the century.

Even Achilles Had a Heel

When the 1940 census takers get through asking all, and nobody goes to jail for being a Republican, we are going to find that about 14,000,000 families are living beyond the reach of gas mains. With these figures and with the new family income statistics as guideposts, we predict that the electrical industry and the oil fuel business will start going out of town in even a greater degree than they have in the past.

New appliance models will be developed to sell at prices the rural trade can afford to pay. And do we assume that once this mass market and its attendant mass production economies in appliance manufacturing develop, that the electrical industry and the oil business are going to concentrate out in the sticks? Our crystal ball doesn't give us any such assurance.

The gas industry has a product in butane and propane — bottled gas to the home owner — that can stop this rural swing to competing fuels before it gets more than started. But it has to be done now, before the load is lost. The entire gas industry has a stake in the successful promotion of liquefied petroleum gas.

As a subject for association cooperation and individual gas utility consideration it is imperative and paramount. Let us never forget that Achilles regarded himself as invincible — but even Achilles had a heel.

HEATING SURVEY AND CALCULATION SHEET

NAME Sketch A- Page 18 ADDRESS

SPACE TO BE HEATED Living and Dining Rooms TEMPERATURE DIFFERENCE 35°F.

TYPE OF APPLIANCE FLOOR FURNACE ☒ VENTED CIRC. ETC. ☐ CENTRAL FURNACE ☐ UNIT FURNACE ☐

GRAVITY ☒ FORCED AIR ☐ RECIRCULATION SYSTEM YES ☐ NO ☐

CONSTRUCTION	TYPE—SEE TABLE	FACTOR
GLASS	WINDOWS—DOORS IN EXPOSED WALLS	52
WALLS	Stucco on wood sheathing Lath and plaster	14
CEILING	Composition roof. Plaster ceiling	13
FLOOR	Double over Vented Space	10

B. T. U. INPUTS PER SQUARE FOOT OF EXPOSED SURFACE AREA

	FACTOR B. T. U. PER SQ. FT.	CENTRAL AND UNIT FURNACES — TEMPERATURE DIFFERENCE BETWEEN INSIDE AND OUTSIDE					VENTED SPACE HEATERS AND FLOOR FURNACES — TEMPERATURE DIFFERENCE BETWEEN INSIDE AND OUTSIDE				
		35	40	45	50	55	35	40	45	50	55
Doors—Windows	1.1	59	68	76	85	93	52	60	67	74	82
Stucco Walls on Wire	0.45	24	28	31	35	38	21	24	27	30	33
Stucco Walls on Wood Sheathing	0.30	16	19	21	23	25	14	16	18	20	22
8" Brick, Lath and Plaster	0.30	16	19	21	23	25	14	16	18	20	22
6" Concrete, Lath and Plaster	0.39	21	24	27	30	33	18	21	24	26	29
Wood Siding on Sheathing	0.25	13	15	17	19	21	12	14	15	17	19
Shingles, Lath and Plaster	0.25	13	15	17	19	21	12	14	15	17	19
Double Floor over Vented Space	0.34	10	13	16	18	21	10	12	13	14	17
Concrete Floor on Ground		4	4	4	4	4	3	3	3	3	3
Shingle, Tile or Composition Roof on Wood Sheathing. Plastered Ceiling Below	0.34	15	17	19	21	23	13	15	17	19	21
Leakage Contents in cu. ft. Multiply by		1.6	1.8	2.1	2.3	2.6	1.4	1.6	1.8	2.0	2.2
Leakage for Central or Unit System without Recirculation. Multiply by		3.1	3.6	4.0	4.5	5.0					

From Table ascertain correct temperature difference for locality in which house is to be erected. Then under the corresponding temperature difference at the top of the table, obtain the proper B.T.u. input per square foot for various types of construction used in the building. Multiply each of the inputs obtained from the table by the area in square feet of the corresponding surface. Likewise multiply the cubical contents of the structure by the corresponding factor in the table. The summation of the individual items gives the necessary B.T.u. input for the system.

	DUCT SIZE[1]—GRAVITY			DUCT SIZE[2]—FORCED AIR		
	SIZE	LENGTH		SIZE	LENGTH
			MAIN		
LEADERS			BRANCH		
RISERS[3]			RISERS		
ROOM NO.			ROOM NO.		
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		

[1]TABLES 2 & 3—SECTION V, PAGE 17—SALES FACTS ABOUT GAS AND GAS APPLIANCES
[2]TABLE 4 —SECTION V, PAGE 21—SALES FACTS ABOUT GAS AND GAS APPLIANCES
[3]USED FOR 2ND & 3RD FLOORS

RECOMMENDATION SIZE 30 M. B. T. U. LOCATION In wall between Dining and Living Rooms on side toward outside wall TYPE Dual Wall

REMARKS

SALESMAN

FIG. 1. Heating survey and calculation sheet.

THERE are just two reasons why gas floor furnaces are not given an important position and active support in any gas utility's selling program. Those reasons are:

1. Where cost of operation is not economical.

2. Complete lack of current knowledge of the virtues of the gas floor furnaces as a successful heating appliance.

There is no answer to number one as far as the purpose of this presentation is concerned.

There is a definite answer to any other reason (and ample proof of validity of answers) advanced for not recognizing gas floor furnaces as a desirable load-building appliance.

Here an attempt will be made to anticipate objections and provide an answer to them; to plead the case generally for floor furnaces to prove their usefulness to the gas industry.

The definite convictions to be expressed are not theoretical imaginings and therefore fictional, in any degree. They are the result of rubbing elbows with floor furnace problems, almost from the time there ever was a floor furnace.

Without indulging in some historical research, I cannot prove the gas industry of the Pacific Coast was the father of the floor furnace, but I know it to be the foster father, at least, because, to my certain personal knowledge, the gas floor furnace has reached its majority and is now 21 years old (maybe a bit older) and getting better and healthier all the time.

In an area where gas heating in all of its forms — steam; warm air furnaces, gravity and forced circulation types operating as central or unit installations; gas steam radiators; radiantfires; circulators; wall furnaces and floor furnaces — provide better than 95% of all heating, the floor furnace is an outstanding and upstanding member of the gas heating family. Quoting definite figures to support this statement is not necessary when it is realized floor furnace installations now in use run into the hundreds of thousands.

Like any other branch of our in-

CALCULATION SHEET

ROOM NO.		DIMENSIONS	TOTAL SQUARE FEET OR CUBIC FEET	FACTOR	B. T. U. INPUT	TOTAL
Living Room	OUTSIDE WALL AREA	2-12'X8' 1-26'X8'	400			
	WINDOWS-DOORS	~~2-1'X3½'~~ ~~2-3'X4½'~~ 1-3'X6'8" 2-3'X4'	71	52	3692	
	NET OUTSIDE WALL →		329	14	4606	
	FLOOR AREA	12'X26'	312	10	3120	
	CEILING AREA	12'X26'	312	13	4056	
	CUBICAL CONTENT	12'X26'X8'	2496	1.4	3494	18,968
Dining Room	OUTSIDE WALL AREA	1-14'X8'	112			
	WINDOWS-DOORS	1-3'X6'	18	52	936	
	NET OUTSIDE WALL →		94	14	1316	
	FLOOR AREA	12'X14'	168	10	1680	
	CEILING AREA	12'X14'	168	13	2184	
	CUBICAL CONTENT	12'X14'X8'	1344	1.4	1882	7,998
	GRAND TOTAL →					26,966

FIG. 2. Calculation sheet.

The Gas

s Floor Furnace

By A. F. RICE Manager, Market Development, Southern California Gas Company

A. F. RICE

• MR. RICE PRESENTS on these pages an article that serves as a timely championship of a deserving but neglected appliance—the gas floor furnace. The article is practical, comprehensive, and provides all the essentials of sizing and location within the building. The installation of floor furnaces from the standpoint of prevailing wind direction is an unique approach. The paper was presented before the Mid-West Regional Gas Sales Conference, Palmer House, Chicago, Ill., on February 15, 1940.—Editor.

dustry, its value depends entirely upon intelligent treatment of it by the industry.

As a start, the first thing is to peg the position of the floor furnace. Few will disagree with the theory, I believe, that the first objective in gas heating sales is a *whole house* plant — either steam or warm air. This is a general observation, but for all-around purposes a major plant is best for customer and utility alike.

Floor furnaces should be considered as the next most desirable type of equipment. The reasons are many:

1. They possess and deliver all the basic virtues inherent in and associated with gas heating. Among those are (a) absolute dependability of fuel supply, (b) instant maximum heat delivery, (c) exactness of control — automatic or manual, (d) means of evaporative humidification, (e) elimination of firing and fuel problems.

2. They are *vented* heating appliances — adding only B.t.u.'s to the air.

3. They, by convection, keep air in motion.

4. They, second to major warm air types having registers in rooms, are least conspicuous. Tucked away beneath the floor line, only floor grills, or floor grills and baseboard registers, are in evidence in the room.

5. They accomplish a whole house-heating job through installation of more than one unit in many areas where rock or high water levels in soil preclude use of basements to house major plants.

6. They, in many cases, are the only possible or practical means of placing gas heating in existing homes.

7. They provide a particularly practical approach to partial gas heating, and by progressive installations whole house gas heating in the medium or

PLACEMENT FROM THE STANDPOINT OF INFILTRATION DUE TO PREVAILING WIND DIRECTION

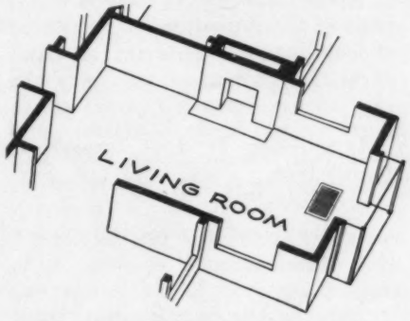


FIG. 3. Heating living room only. No prevailing wind pressure.

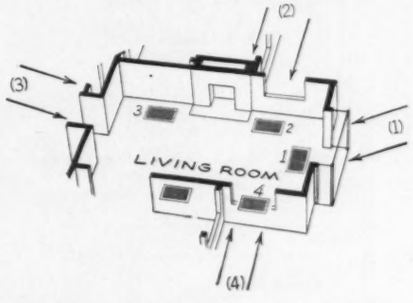
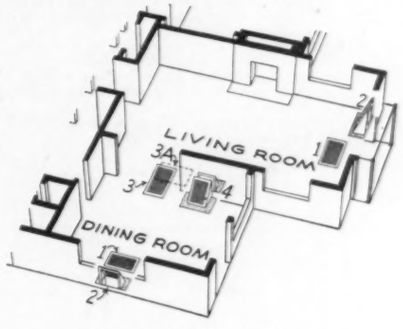


FIG. 4. Heating living room only. Prevailing wind pressures from (1), (2), (3), (4).



1. Two units: flat register type.
2. Two units: wall type.
3 (or 3A). One unit: flat register type.
4. One unit: dual type.

FIG. 5. Heating living room and dining room. No prevailing wind pressure.

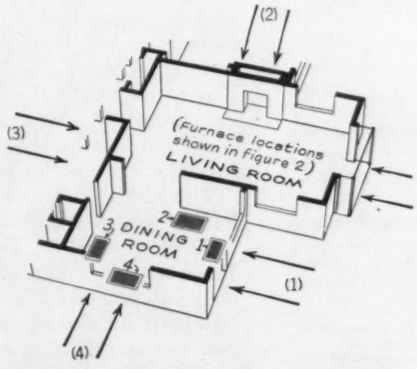


FIG. 6. Heating living room and dining room. Prevailing wind pressures from (1), 20, (3) and (4).

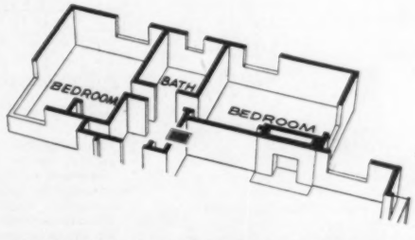


FIG. 7. Heating bedroom wing. Disregard wind pressures in small restricted areas

lower income bracket homes, where equipment first cost, rather than fuel cost, is the problem.

8. They provide an ideal type of auxiliary gas heating for early fall and late spring use in homes equipped with major plants, either gas or competitive. A load is secured and a customer is comfortable where neither would be likely if a major plant had to be operated.

9. They supplement major plants which only partially heat remote, or difficult to heat, areas in homes.

10. They are highly economical in providing plus heat where needed, or partial heating of definite home areas where it is specifically required.

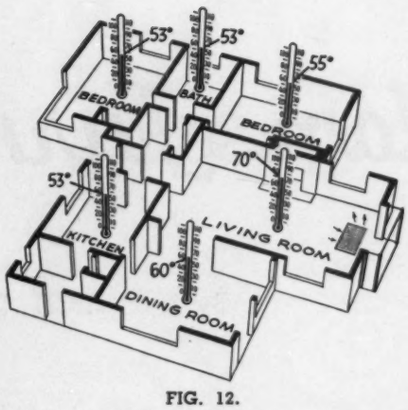
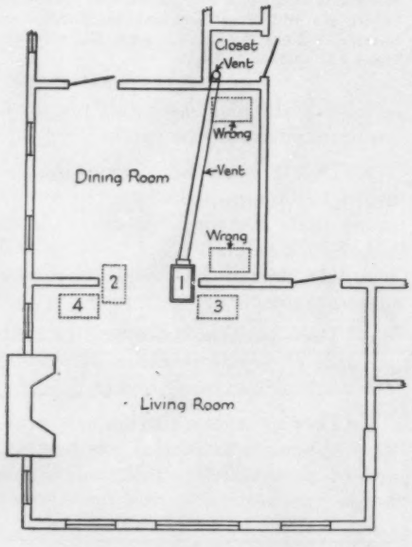


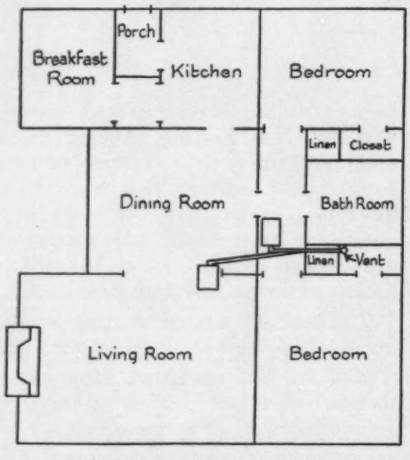
FIG. 12.

GENERAL CONSIDERATIONS IN PLACEMENT



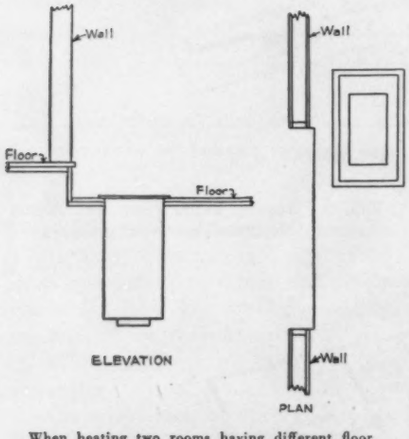
Showing furnace located in archway and vertical vent in closet. Horizontal vent should be as direct as possible, using as few ells as practical. Furnace should never be placed closer than 3 in. from wall to edge of register.
When two rooms are to be heated by a single furnace, the central location, *i.e.*, locating the furnace in the archway or just to one side of the archway has proved the more satisfactory. If the furnace is to be placed to one side of the archway, locate in the room having the greater heat loss.

FIG. 8. Location 1.



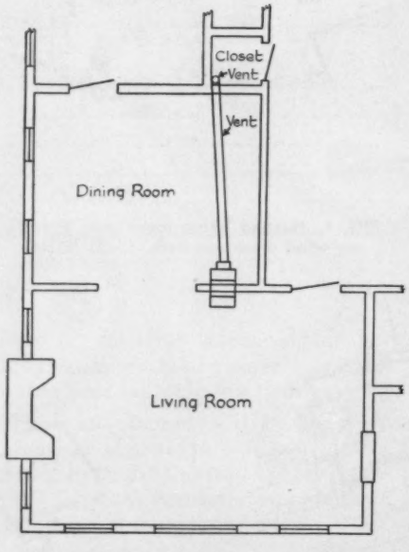
In mild climates two furnaces will heat a small compact house. The sketch below shows one furnace in the archway to heat the living and dining rooms and another furnace in the hall to heat the two bedrooms. These two furnaces are connected to a single vertical vent located in front bedroom closet.
In more severe climates each bedroom would require a separate furnace due to greater heat losses as well as necessity of faster circulation of air throughout area being heated.

FIG. 9. Location 2.



When heating two rooms having different floor levels, the furnace should be located in the room having the lower floor. It is also well to locate the furnace near the step, if possible, as this would be a central location which is desirable when heating two rooms by a single furnace.
Were the furnace located on the upper level, a cold layer of air will form in the lower level resulting in cold floors.

FIG. 10. Location 3.



Showing dual furnace located between living and dining rooms. Duals also make ideal installation between adjoining bedrooms or bed and bathrooms. Horizontal vent should be as straight as possible, using as few ells as practical.
Duals located between living room and hall make a most desirable installation. With this type of installation a single dual will heat a small, compact house.

FIG. 11. Location 4.

HEAT

This array of positive advantages would seem to be sufficient to justify the adoption of a policy, by all utilities, favorable to the sale of floor furnaces.

Unfortunately, there is still opposition to giving floor furnaces an accepted and favorable position in the sales policies of some utilities. The reason advanced is *unsatisfactory experience*. The unsatisfactory experience is probably real enough, but some of it was had 15 years ago, when the floor furnace itself may have been at fault; some of it that long ago and up to recent times was not and is not the fault of the appliance, but the method of handling it.

Correct treatment must be applied to:

1. Selection of floor furnace and burner type.
2. "Sizing."
3. Placement in areas to be heated.
4. Installation.
5. Venting.
6. Operative control.

Deficiencies of floor furnaces, other than burner performance, that contributed to unsatisfactory experiences in the past do not exist in floor furnaces passing current A.G.A. requirements. Those that handle floor furnaces meeting latest A.G.A. requirements have taken the first correct step to successful experience with gas floor furnaces.

The next step is to know the type of burner required to properly handle the kind of gas served. Both bunsen and luminous types are available. Burner noises — on and off concussions — can be cured by the selection of the correct burner. This is a local problem and any unsatisfactory experience is the direct responsibility of the local utility involved and no one else.

The problems of a good acceptable

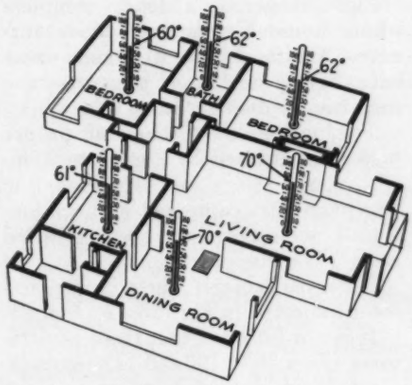


FIG. 13.

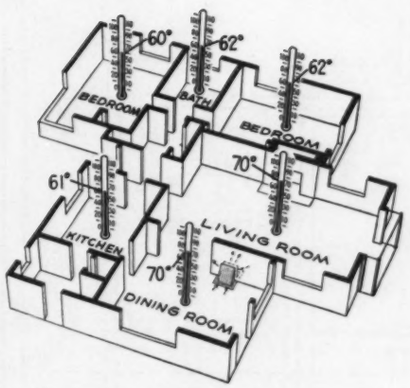


FIG. 14.

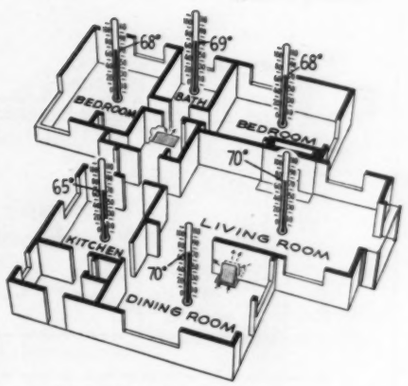


FIG. 15.

DISTRIBUTION CHARACTERISTICS

floor furnace and a satisfactory burner to operate it are solved because they are purely physical and easily solved.

The other causes of unsatisfactory experiences are human, hence less controllable and more complex and depend entirely on willingness and capacity to understand performance and service characteristics of floor furnaces in order to avoid unsatisfactory experiences.

Sizing

The size of floor furnace, its capacity in B.t.u., output or input, is directly related to heat loss of area to be heated. Heat loss must be calculated as correctly, and selection of capacity must be as exact, as for any major plant. Guesses make only one thing certain — unsatisfactory experience. Too small, or too big, means chilled rooms, cold floor lines, stuffy stratification.

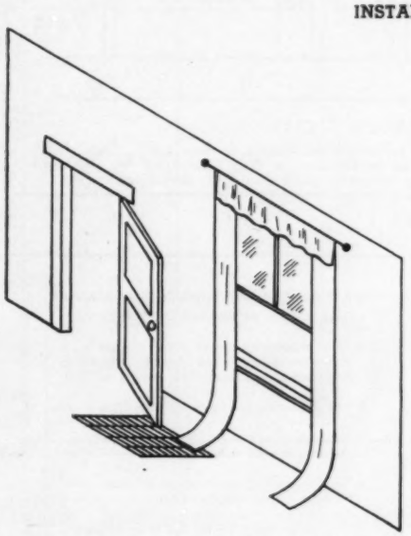
For ease and speed in sizing, a *simplified code* is desirable. With such, anyone capable of accurate measurement, multiplication and addition can *size* satisfactorily. One such simplified code and a supporting calculation sheet are shown as Figs. 1 and 2.

This simplified code is not being promoted or even defended as being good. It is submitted to indicate what can be done to make sizing easy, hence avoiding unsatisfactory experiences because of improper sizing.

Placement of floor furnaces is probably the most difficult thing to accomplish. It is usually a matter of compromising between an ideal spot and what the user will permit, or limitations imposed by the building structure itself.

Eliminating effect of wind pressures and aggravating cold air sources, the *ideal* spot for placement would be the mathematical center of a room, a floor

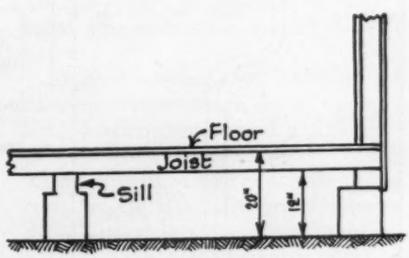
INSTALLATION



Floor furnaces should not be located in the following ways:

1. With grille nearer than 6 in. to any wall.
2. In a pathway where people must pass frequently directly over the grille.
3. Where a door can swing over the furnace.
4. Where long curtains can drag over.

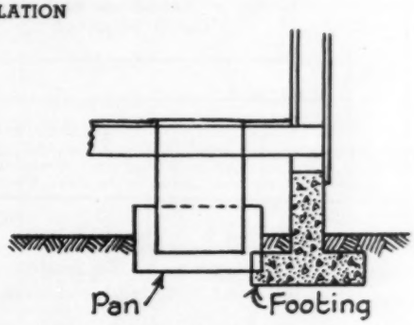
FIG. 16.



Check underneath for:

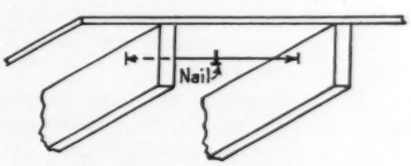
1. At least 12-in. clearance beneath joist or 20-in. below floor.
2. Evidence that water runs in from street.
3. Floor joist location. Will a small change save cutting a joist"
4. Sill location. Avoid cutting if possible.
5. Concealed footings that may have to be chipped away. Avoid this if possible.

FIG. 17.



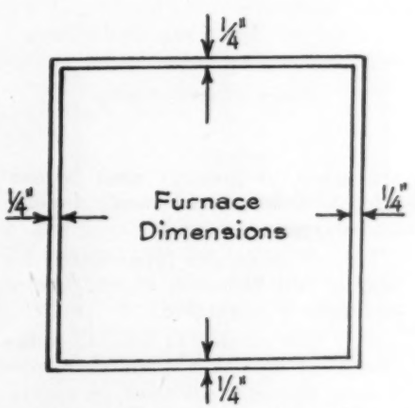
Carpenter should check underneath to see that a clear opening can be cut.

FIG. 18.



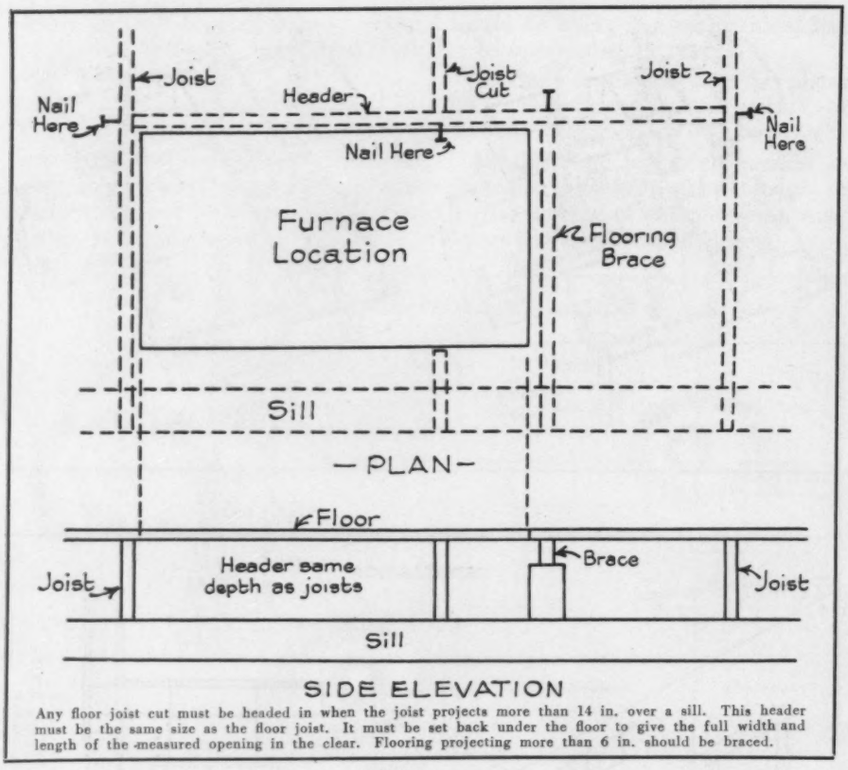
Best method for checking exact distancees underneath is to drive a nail through exact center of proposed location and check from this point to joists or sills.

FIG. 19.



Measurements for cutting should be ½ in. larger than over-all dimension of furnace. Any variation in sawing must be inside this extreme outside measurement.

FIG. 20.



Any floor joist cut must be headed in when the joist projects more than 14 in. over a sill. This header must be the same size as the floor joist. It must be set back under the floor to give the full width and length of the measured opening in the clear. Flooring projecting more than 6 in. should be braced.

FIG.21.

furnace in each room to be heated. Immediately, good taste and common sense indicate a compromise.

The illustrations, Figs. 3 to 7, inclusive, though inadequate in number to cover the field of floor plan variations, are an attempt to show, descriptively, placement practice that will afford satisfactory results.

Fig. 3 illustrates the most simple placement. It is placed nearest the point of greatest apparent *cold air* infiltration.

Fig. 4 illustrates various placements where prevailing strong winds (15 m.p.h. or greater) must be considered. Other requirements become secondary.

Fig. 5 illustrates placements for heating two adjoining rooms. Use of two units is preferable.

Fig. 6 is similar to Fig. 4; shows placement in dining room where prevailing strong winds must be considered. Under such conditions, a separate unit each for living and dining rooms is essential. Single units as shown in placements 3, or 3A, 4, and Fig. 5, are apt to prove unsatisfactory.

Fig. 7 illustrates a step to complete whole house heating with floor furnaces. Obviously, small rooms react but slightly to wind pressures and such can be disregarded.

To augment the outline of proper placement covered by Figs. 3 to 7, inclusive, and the related text, Figs. 8 to 11 (page 20), captioned as Locations 1 to 4, inclusive, have been extracted from a contemporary source.

Note, particularly, the *wrong* placement indicated in Location 1 (Fig. 8).

It is not intended that these illustrations (Figs. 8, 9, 10, and 11), attempting to act as a guide to placement, are in any way a substitute for intelligence or judgment.

Each job must be analyzed to determine the final proper placement.

Heat Distribution

Figs. 12, 13, 14, and 15 (pages 20, 21), the latter one including bedroom wing installation, illustrate clearly typical temperature expectancies, though not exact ones. In practice, temperatures will likely vary, even though only slightly, from those shown.

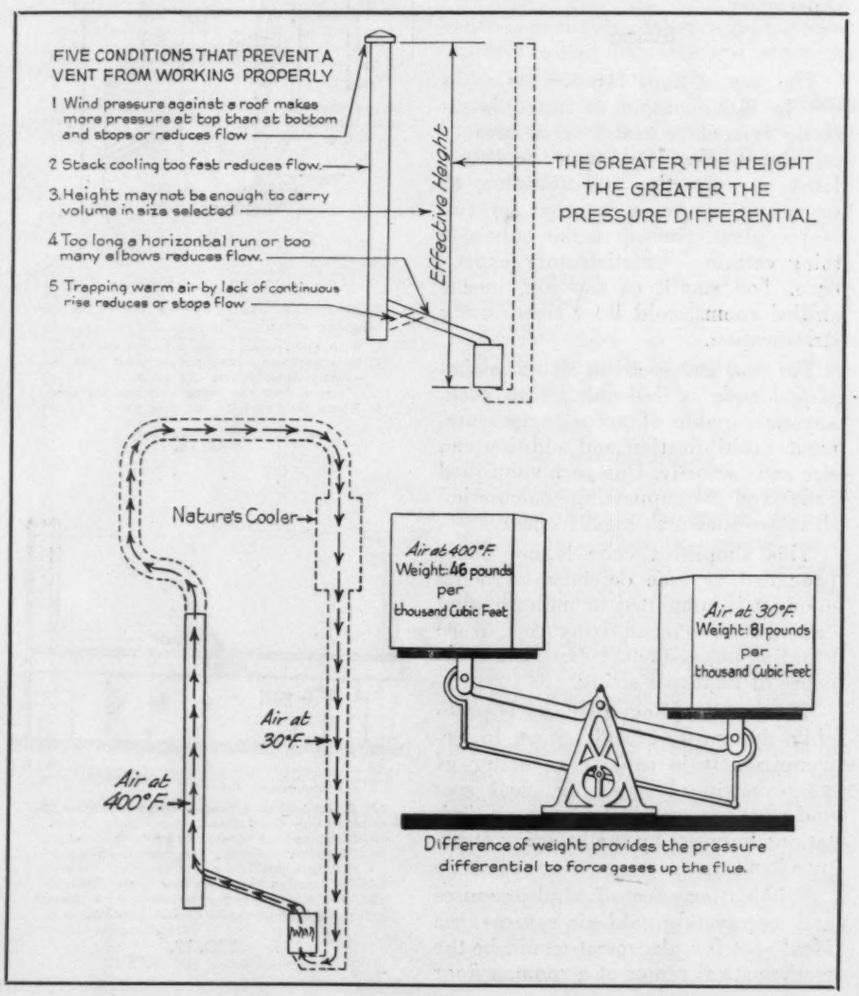

FIVE CONDITIONS THAT PREVENT A VENT FROM WORKING PROPERLY
1 Wind pressure against a roof makes more pressure at top than at bottom and stops or reduces flow
2 Stack cooling too fast reduces flow.
3. Height may not be enough to carry volume in size selected
4 Too long a horizontal run or too many elbows reduces flow.
5 Trapping warm air by lack of continuous rise reduces or stops flow
Effective Height
THE GREATER THE HEIGHT THE GREATER THE PRESSURE DIFFERENTIAL
Nature's Cooler
Air at 400°F.
Air at 30°F.
Air at 400°F. Weight: 46 pounds per thousand Cubic Feet
Air at 30°F. Weight: 81 pounds per thousand Cubic Feet
Difference of weight provides the pressure differential to force gases up the flue.

FIG. 22.
(At Right)
Theory of Gravity Venting

How a floor furnace is installed does not control heat distribution — that depends on what size and where — but it has much to do with its operating performance and customer satisfaction.

There are only a few fundamentals that cannot be disregarded. They are:

1. Floor furnaces are neither subterrane or submarine devices. If installed below soil surface line, in dirt pits, where either soil or water may refill clearances and impair combustion, or air circulation, or both, or prevent them entirely, unsatisfactory experiences follow. Waterproof, erosion and corrosion proof pits of either concrete or metal provide the solution.

2. Floor furnaces are not designed to add structural strength to the structure wherein they are installed. (a) When floor joists must be cut, sturdy, well-fitted headers must be installed. else floors will sag and give. (b) When a selected spot for installation falls above a house stringer, a new spot must be selected. Cutting a stringer is dumb — naught else — as floor, house and all will sag, give and bulge.

Installation Fundamentals

Figs. 16 to 21, inclusive, extracted from a contemporary source, will serve to illustrate the fundamentals of installation just discussed.

Accept the fact that installation procedure must be that of creating a cradle (without weakening a building structurally) in which to rest the floor furnace. Do this and a cause for unsatisfactory experience is checked out.

Floor furnaces, as other appliances, have no supernatural control of products of combustion; after they enter the draft diverter, they are on their own and are prone to follow exact laws of physics.

In venting a floor furnace:

1. Don't run lateral vents horizontally — elevate them toward the flue on a grade of 1 in. per ft.

2. Don't run lateral vents as long as or longer than the vertical flue is high, or throw in two or three ells to get flue products dizzy and confused. The lateral length should not exceed approximately 75% of vertical flue height; each elbow will reduce maximum length approximately 20%.

3. Don't connect lateral vents into undersized or overloaded flues; or, as has been done, tie into leaders on the supposition flue products will travel up any pipe that water will run down; or further, don't expect uninsulated vertical flues, installed inside or outside, to keep flue products hot enough to flow upward. Flues must be adequate, heat retentive, vertical, with the outlet unobstructed and extended above nearby roof ridges, walls or trees. Insulated false flues may be necessary inside of oversized brick chimneys. Figs. 22 and 23 illustrate the points covered.

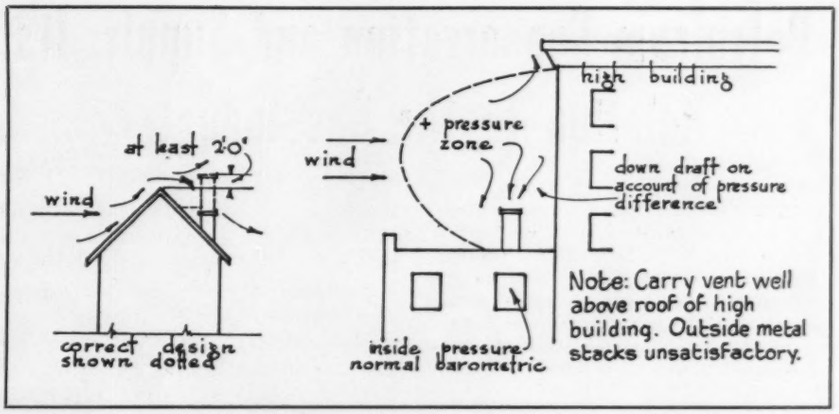

at least 2'0"
wind
correct design shown dotted
wind
+ pressure zone
high building
down draft on account of pressure difference
Note: Carry vent well above roof of high building. Outside metal stacks unsatisfactory.
inside pressure normal barometric

FIG. 23. Indicating safe practice in chimney heights under various conditions.

Outside Temperatures	Temperature Rise	Maximum Flame	Minimum Flame	
60°	10°			Fixed
50°	20°			Elevated
40°	30°			Manually

FIG. 24.

Permitting any makeshift or cobbled venting practice is a cause for unsatisfactory experience, a fault of local administration, not of floor furnaces.

Manual control for holding satisfactory temperatures is a matter of human sensitiveness and a willingness to operate a control valve. Thermostatic control, either in built or wall type, modulating or snap-operating, should provide a minimum flame.

1. A fixed, unchangeable minimum flame must be low enough not to be capable, of itself, of raising room temperatures more than 2° to 3° F.: result — 67° outside temperature will not find the minimum flame building up room temperatures to 80° and beyond. Generally, this type of operation will be successful (particularly so when outside temperature drop is small or climate is uniformly mild).

2. On days of extreme temperature differences (assume 40° rise), particularly in territories where rigorous climates prevail, users should be taught to adjust the manual "on-off" valve to hand set a "minimum" (above a low limit minimum), having a relation somewhat in proportion to the requirement for heat — for instance, as illustrated in Fig. 24.

Purpose

Because of the wide field, varied conditions and limit of space and time, no attempt to be exact, or claim of exactness, in detail is intended in this report. Its whole purpose is to indicate where remedies lie, for those who claim unsatisfactory experience with floor furnace installations.

Those who have studied, and mastered, and who apply the correct measures, have found the floor furnace to be a happy, healthy, effective warrior in the ranks of the Gas Industry Army.

Petroleum Conservation and Supply; Its Relation to the Gas Industry

• **FRED VAN COVERN, director, Department of Statistics, American Petroleum Institute, New York, N. Y., in a paper, "Petroleum Conservation and Supply, and the Gas Industry," presented before the Annual Meeting of the New England Gas Association, Statler Hotel, Boston, Mass., March 14, 1940. — (Abstract by G A S.)**

DURING 1938 there was a total of about 14 million barrels of gas and fuel oils used by gas-producing companies in the United States, about 90% of which was used in carbureting processes. Approximately 10% of the total was used in the New England states, but neither in this area nor the country as a whole is the gas industry consuming as much oil as in 1929 or 1930. Both groups have, however, increased their use of petroleum oils almost constantly since 1933, but this does not mean that the gas industry is calling for an ever-increasing portion of the yield of products from the barrel of crude oil. Runs to the stills of refineries of crude petroleum have also increased, and quite rapidly, with the result that neither in the New England district, nor in the country as a whole, has the gas industry asked the petroleum industry for even as large a portion of each barrel of crude oil processed as formerly.

New England Statistics

From the figures available, it appears that the total production of gas in the New England area by all processes has remained practically stationary during the past five or six years. It is a fact, however, that the production of carbureted water-gas has increased considerably during that period, indicating that the production of gas by carbonizing processes has been decreasing. It also appears that while the consumption of coal and coke used in the carbonizing processes has experienced an almost continuous decline, the consumption of petroleum oils is increasing and the amount used to enrich water-gas is going ahead relatively faster than the amount of carbureted water-gas produced.

In 1929 New England gas producers used about 2.93 gals. of petroleum oils to every M c.f. of carbureted gas made. Practically all of this oil was of the gas-oil type. It appears that by 1938 that figure had risen to 3.45 gals. per M c.f. By far the greater portion of this oil was a heavy residual but of considerably lower cost per barrel. The increase in the quantity of enriching oil used probably is not due to any increase in the heating value of carbureted water-gas, since operating practice and state regulatory standards have not moved in this direction. More probably it is due to the trend towards the use of the heavier and cheaper petroleum oils, both as generator fuels mixed with coal and in the carburetor and also as boiler fuel. The gas oil of 1929 probably had an available gas enrichment value of about 125,000 B.t.u. per gal. Heavy residual oil has only about 100,000 B.t.u. per gal. available. Hence, substitution of heavy oil for gas oil indicates about a 25% increase in the use of oil per unit volume of gas produced. It is also a fact that the production of tar is about doubled when heavy oil is substituted for gas oil. This should not prove to be a disadvantage, however, in that the tar so formed profitably can be disposed of, although at a lower unit value in the case of heavy oil tars, but nevertheless further reducing the unit cost of the oil.

The gas industry in New England, therefore, seems to be in a well-defined trend toward the use of increased quantities of the heavier petroleum oils, and a continuously smaller amount of solid fuels.

Pacific Coast Gas Association Holds Technical Conference This Month

PROGRAM arrangements for the Pacific Coast Gas Association's Spring Technical Conference, to be held April 11 and 12, have been practically completed, it has been announced by Harry J. Smith, Pacific Gas and Electric Co., chairman of the Technical Section. Meetings will be held in the Embassy Auditorium, Los Angeles.

Featured speakers will include J. H. Thacher, Jr., Standard Oil Co. of Calif., speaking on "Deep Drilling in California"; C. L. Parkhill, Parkhill-Wade, whose subject will be "Developments in the Liquefied Petroleum Gas Industry"; and Ford Ashman Carpenter, consultant on meteorology and aeronautics of the Los Angeles Chamber of Commerce, who will discuss "Influence of Latitude on Weather on the Pacific Coast."

Harold G. Laub, Southern California Gas Co., is chairman of the Arrangements Committee for the meeting.

Distribution Committee reports will be in charge of C. P. de Jonge, San Diego Consolidated Gas and Electric Co., chairman. Sub-committee reports will be made by C. W. Capwell, San Diego Consolidated Gas and Electric Co.; W. L. Kindred, Southern Counties Gas Co.; E. R. Ames, Southern Counties Gas Co., and S. A. Bradfield, Southern California Gas Co.

The Transmission Committee, under Chairman Grove Lawrence, Southern California Gas Co., will present sub-committee reports on pipe lines by C. F. Briscoe, Southern California Gas Co., and N. K. Senatoroff, Southern Counties Gas Co., and a report on measurement by George H. Briggs, Pacific Gas and Electric Co.

The Utilization Committee, John C. Mueller, Payne Furnace and Supply Co., chairman, will present a report of its sub-committee on air conditioning, of which Arthur J. Hess, English & Lauer, Inc., is chairman. Other air conditioning papers will be given by C. L. Peterson, Minneapolis-Honeywell Regulator Co., and H. G. Ufer, Underwriters Laboratories, Inc. The appliance installation sub-committee will also report under the direction of H. W. Geyer, Southern Counties Gas Co.

H. J. SMITH

A. E. HOLLOWAY

A. E. Holloway, San Diego Consolidated Gas & Electric Co., is president of the P.C.G.A.; Clifford Johnstone is managing director.

A general view of Northern Natural Gas Co.'s 16-inch line showing line "tied-in" over ditch in northern Iowa.

Building a 243-Mile Pipe Line

By J. P. BRISTOW Assistant Chief Engineer, Northern Natural Gas Company

NORTHERN Natural Gas Co. of Omaha has recently completed additions to its system consisting of 243 miles of 16-in O.D. all-welded steel pipe line, 125 miles of 2-, 3-, 4-, and 6-in. branch lines to 19 communities, a pipe line suspension bridge over the Missouri River, a new 1600-hp. compressor station near South Sioux City, Neb., and an additional 1300-hp. unit at its Palmyra, Neb., station. Coincident with this program Peoples Natural Gas Co., a distributing subsidiary, completed gas distribution systems in eight different communities in Iowa and Minnesota.

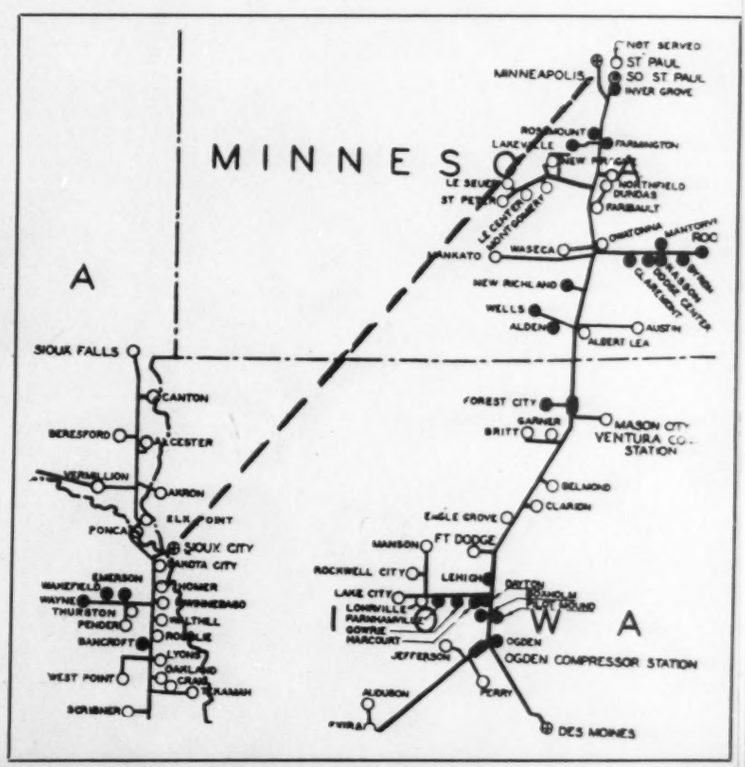
The new 16-in. line provides for greatly increased deliveries in the Minneapolis-St. Paul area and through its connection of the west trunk line near South Sioux City, Neb., with the east trunk line near Minneapolis, Minn., it additionally provides all the operating and maintenance advantages of a loop for the entire system north of Palmyra, Neb.

The communities added to the system and served by the new 16-in. line are:

In Iowa: Kingsley, Spencer, Marcus, LeMars, Milford, Paullina, Spirit Lake, Cherokee, Hartley.

In Minnesota: New Ulm, Truman, Welcome, Sherburn, Cleveland, Fairmont, Jackson, Worthington, Chaska.

With the exception of rough hill land near Sioux City, Iowa, a few peat bogs in northern Iowa and southern Minnesota and glacial deposits near Minneapolis, the country traversed by the new line is mostly rich farm land and no unusual construction difficulties were encountered. Aerial surveys of the entire route of the line greatly expedited the selection of the route and location of the line.



AT RIGHT: Map showing a portion of Northern Natural Gas Co.'s pipe line system. The dotted line indicates the approximate course of the company's new 243-mile natural gas carrier from Sioux City, Iowa, to Minneapolis, Minn.

AT RIGHT: A front view of the enameling and wrapping machine.

BELOW: Patching enamel, followed by holiday detector.

ABOVE: Enameling and wrapping machine, showing application of Kraft paper and felt.

The line is of solid welded construction throughout. It is laid with ample slack in a 32-in. ditch with a minimum cover of 36 in. and is designed for an operating pressure of 600 lbs. Construction was started on August 22, 1939, and completed on November 24, 1939. Except for a few days, unusually fair weather and moderate temperatures prevailed throughout the period.

All welds are three-bead without back-up or chill rings and were reinforced by split welding sleeves in stream crossings, peat bogs and swampy places. The line is weighted with cast iron river clamps in stream crossings and swamp land.

The line was constructed in four sections with four complete construction crews: one working easterly from South Sioux City, Neb., into Iowa; one working southwesterly from the Iowa-Minnesota state line; one working southwesterly; and one northeasterly from Mankato, Minn. As the work progressed, a temporary line across the Missouri River near Sioux City, Iowa, provided gas for testing and service to communities on the first section in Iowa and a connection with the existing branch line to Mankato, Minn., provided gas for testing and service to Minnesota towns.

The 16-in. (¼-in. wall) pipe was furnished in double random lengths, 120 miles of seamless by National Tube Co. and 123 miles of electrically welded by the Republic Steel Co. and the Youngstown Sheet & Tube Co.

The pipe, shipped bare from the mill, was strung along the line, welded into three- to five-joint sections, and then tied in over the ditch. The Johns-Manville traveling-type machine was used for enameling and wrapping. The cleaning and priming machines were followed by the enameling and wrapping machine, which applied one wrapper of Kraft paper over the enamel and a wrapper of 15-lb. Johns-Manville asbestos felt over the paper in one operation. Split welding sleeves and bends were skipped by the machine, enameled and wrapped by hand.

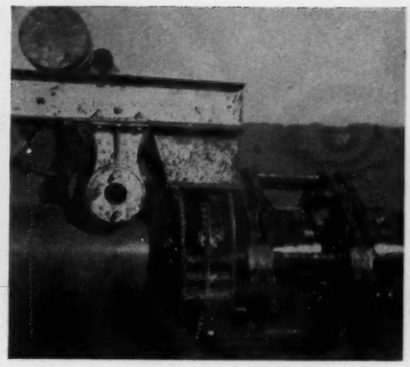
The enameling and wrapping machine was followed by holiday detectors which were again used after patching and before the line was lowered in. The primer and enamel were furnished by the Wailes, Dove-Hermiston Corp. and were applied with a minimum thickness of 1/16 in.

The main line valves were 16-in. Merco-Nordstrom plug valves with 6-in. by-pass and blow-off assemblies, installed at intervals of 7 to 10 miles. The pipe on each side of each valve was anchored by concrete blocks with the lower half of the pipe resting in the block. Two straps were placed over the pipe and plates reinforced by gussets were welded to the pipe in such manner as to provide a bearing on the concrete block. Branch lines are connected to each side of the main line valves so service may be maintained with either main line section out of service.

The 111 miles of line in Iowa and Nebraska were constructed by C. S. Foreman Co. of Kansas City, Mo., and 132 miles in Minnesota by Truman-Smith Construction Co., El Dorado, Kan.

A general view (above) of the South Sioux City compressor station. An interior view (below) of the compressor station building.

ABOVE: A cleaning and priming machine, showing the cleaning head.



AT LEFT: A cleaning and priming machine, showing the priming head.

BELOW: "Batching" enamel before "lowering in."

Monarch Construction Co., Pampa, Texas, constructed 83 miles of 2-, 3-, 4-, and 6-in. branch lines to 15 communities and distributing systems in eight communities for Peoples Natural Gas Co.

In addition to the foregoing, Williams Brothers of Tulsa, Okla., built 18 miles of 6- and 4-in. line extending from this main 16-in. line to Chaska and Shakopee, Minn., and Truman-Smith Construction Co., 24 miles of 6-in. line to New Ulm, Minn.

Change-overs to natural gas and the commencement of service in new distributing systems were handled by the companies operating in the different communities.

The pipe line suspension bridge for the 16-in. line crossing the Missouri River south of Sioux City, Iowa, is 2640 ft. in length from rest-pier to rest-pier with a center span of 1320 ft. The main towers are 150 ft. in height and carry the pipe at an elevation which provides a minimum clearance of 52 ft. above standard high water. The pipe on the bridge is 16-in. O.D. seamless, 5/16-in. wall thickness, and welded with three-bead welds reinforced by split welding sleeves. Lighting facilities have been installed as specified by the Civil Aeronautics Authority and the United States Coast Guard.

The bridge was designed by Matthews & Kenan, consulting engineers, San Antonio, Texas, and was constructed by the Pittsburgh-Des Moines Steel Co. of Des Moines, Iowa.

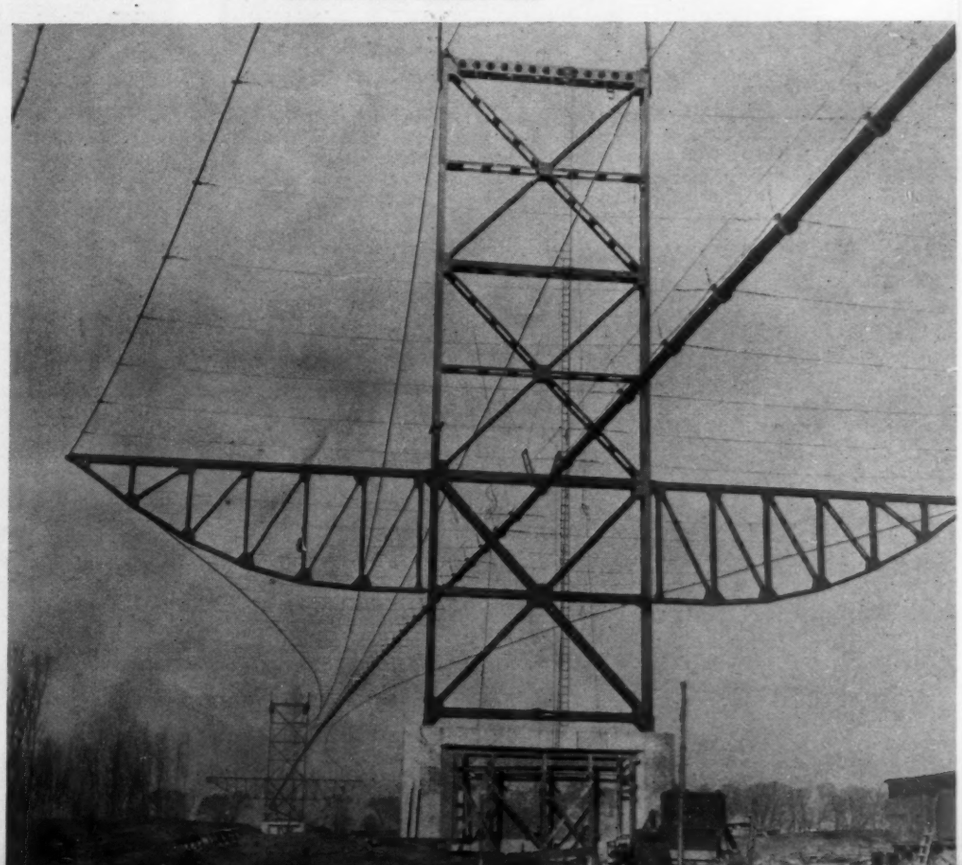
The new 1600-hp. compressor station near South Sioux City, Neb., at the connection between the new line and the 16-in. Sioux City-Sioux Falls line, is of the usual type and includes two 800-hp. Cooper-Bessemer Type 19 units, equipped with Fluor air-cooled exhausts. The main building provides for a future third unit. Gas may be delivered from either line into the other so the full advantage of the loop line may be taken as needed or desired. This station was constructed by Stearns-Roger Manufacturing Co. of Denver, Colo.

A fourth 1300-hp. Worthington unit was installed at Northern's main line station near Palmyra, Neb., together with a new auxiliary building, changes in piping and reinforcement of existing piping. This station is located at the junction of the 24-in. main line which extends into Iowa and Minnesota and the 20-in. line extending northward through Nebraska to Sioux City, Iowa, and Sioux Falls, South Dakota. The discharge connections at this plant provide for separate control of the pressures in the 20- and 24-in. lines as desired.

All work at this station was done by the Fluor Corp., Ltd., of Los Angeles, Calif., and Kansas City, Mo.

The entire project, which was substantially all completed within a period of three months, required approximately 47,800 tons, or 1500 carloads, of steel pipe, machinery and other materials, and the employment of labor approximating 122,500 man days. Except for the skilled labor necessary, local labor from the communities along the line and near the sites of work was employed.

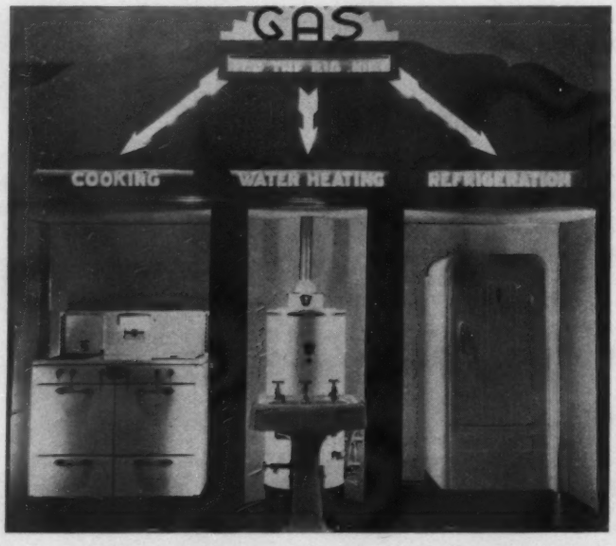
A general view of Northern Natural Gas Co.'s suspension bridge across the Missouri River from the Nebraska side.



GAS Camera

. . . SHOWMANSHIP means Sales . . . and in the finely developed art of display, the gas utility is no laggard. On this page a few examples depicting how a gas utility keeps its service in the public eye.

This colorful and beautifully arranged all-gas kitchen was presented to the Los Angeles "Times" by the Natural Gas Bureau of the Southern California and Southern Counties Gas Companies. From this stage home economists of this great morning daily will preach the gospel of gas cookery at regularly conducted cooking schools.



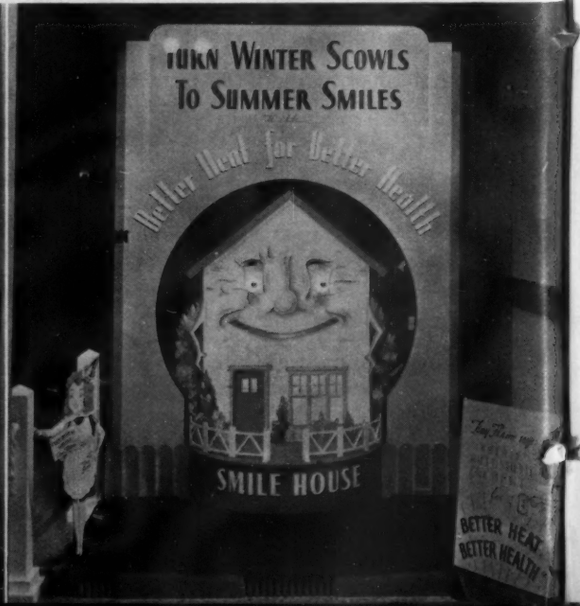
Many a visitor to Wisconsin Public Service Corporation's Green Bay office has been stopped by the above display. Designed by Display Manager Karl Rockstroh, the display features a progressive illumination of message and three arrows, each group flashing in turn. Modern lighting and fluorescent lamps spot the appliances.

Tops in baths
HOT WATER FROM A MONEL TANK IS CLEAN AND INVITING-
HOT · CLEAN · INEXPENSIVE WITH THE RUUD MONEL TANK AUTOMATIC GAS-WATER HEATER

An invitation to the bath is this eye-catching display designed by Harry Swenson, display manager for Peoples Gas Light and Coke Co. of Chicago. The unusual poster saw long service in one of the company's Michigan Avenue windows. The photo was submitted by M. M. Scott of Ruud Manufacturing Co.'s advertising department.

AT RIGHT

"Better Heat for Better Health" has long been axiomatic with United Gas Corp. of Houston, Texas. This unique display has done its bit toward bringing automatic gas heating prospects to the sales floor. The "Smile House" and the "Scowl House," with flashing eyes, revolve while the rest of the exhibit remains stationary.



THE MATERIAL TESTING OF *Cellulose Pipe Wrappers*

THE use of cellulose membranes, in conjunction with other materials, as a protective medium in pipe line coatings was first conceived about nine years ago. The experiences of the Southern California Gas Co. have proved that this type of protective wrapper is effective. An investigation of the condition of pipe lines wrapped with these membranes was made by H. G. Laub. This investigation showed that the condition of pipe on which these wrappers were used was decidedly better than those lines using other types of wrappers of comparable first cost. Further inspections have also shown the value of this type of wrapper.

The present specifications of the wrapper used by the Southern California Gas Co. are as follows:

1. One coat of primer on blast-cleaned pipe.
2. One coat of company specification asphaltic material applied with a minimum of 0.10 in. thickness.
3. Two wrappings of a cellulose wrapper. These membranes are each 0.00088 in. thick.
4. One coat of company specification asphaltic material applied with a minimum thickness of 0.10 in., and
5. One wrapping of 60-lb. Kraft paper.

Some of the desirable characteristics for a cellulose pipe wrapper are: (1) impermeability to oils and water, (2) high softening and melting points, (3) easily applied to the pipe by hand or machine, (4) chemical and physical stability when heated, (5) insoluble in water, air, oils, or soil, (6) high tensile strength, hot or cold, (7) homogeneity, (8) economical to use.

Much research has been done regarding the water permeability of cellulose membranes, particularly by the manufacturers of these materials and the United States Bureau of Standards (2, 3, 4, 5). All, apparently, have their own methods of testing but express results in practically the same manner, *i.e.*, as impedence to water per sq. in., sq. ft., or sq. meter. In the Southern California Gas Co. investigations the testing procedure and the equipment for the water and the water vapor permeability tests were adopted from the best methods found in the literature, and tests were made using the materials as used in their pipe-coating yard.

• **A. C. ALTER, Southern California Gas Co., Los Angeles, in a paper, "The Material Testing of Cellulose Pipe Wrappers," to be presented before the Spring Technical Conference of the Pacific Coast Gas Association to be held in the Embassy Auditorium, April 11 and 12, 1940. — (Abstract by GAS.)**

Cells for making the water vapor permeability tests are constructed in the following manner: Small glass crystallizing dishes (Fig. 1) 2 in. in diameter and 1½ in. high are cemented to a glass ring. This ring has an O.D. of 3¼ in. with a hole in the center 1½ in. in diameter. It is ¼ in. thick and is the type used in size 1-A Sprague meter valves. The cement is made by melting together equal parts of beeswax and resin. Another disc of the same type is used to hold the membrane. One face on each disc is ground flat so that, when the membrane is placed between these two surfaces, there is no air space due to uneven surfaces.

Fifteen cubic centimeters of water, to which has been added 44.8 grams of $CaCl_2.2H_2O$, is placed in each crystallizing dish. This amount of calcium chloride will absorb approximately 11 or 12 grams of water before the solution becomes undersaturated. In this way a saturated solution of calcium chloride is maintained at all times during the period of the test. By keeping a saturated solution in the cells, the vapor pressure differential (V.P.D.) across the membrane will be fairly constant. It will vary only as the temperature and humidity in the test oven vary.

A disc of membrane to be tested is cut approximately ¼ in. smaller than the glass disc. This is then cemented in place on the disc attached to the dish with the same sealing compound described. Only a thin coat of sealing compound is necessary as its purpose is to prevent the passage of moisture between the glass disc and the edge of the membrane. The upper disc with its ground surface next to the membrane is then cemented in place in the following manner: While the two glass discs are held together with a slight pressure of the fingers, a substantial thickness of sealing compound is applied around the outer edges of the two discs. The cells are made up in duplicate.

Two other cells are made up as described, using a test piece cut from the membrane which has been heated in an oven for 15 minutes to 325° F., the average temperature to which the asphalt is heated when applied over the membrane in the regular pipe yard

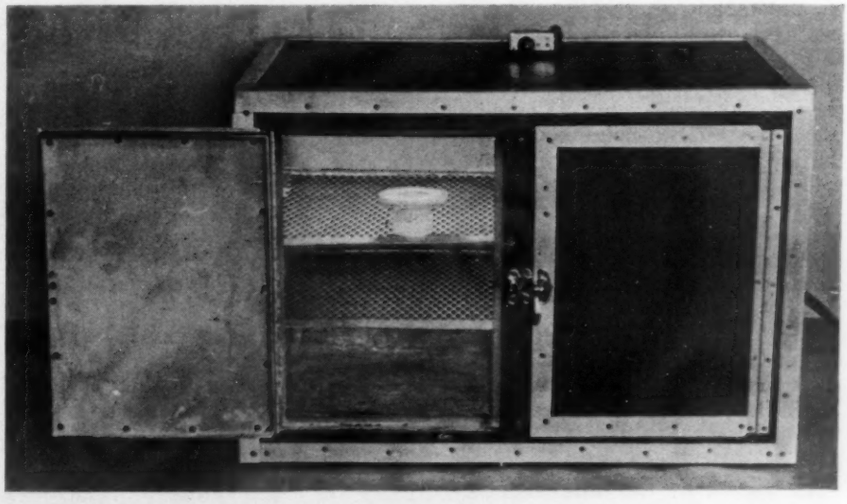


FIG. 1. Constant temperature and humidity oven and test cell (on top shelf) for water permeability tests on cellulose membranes.

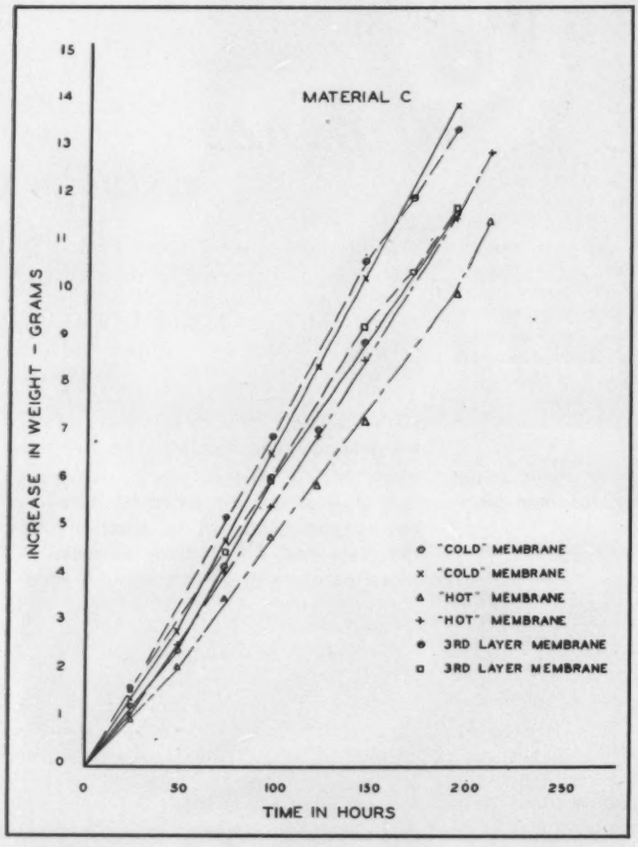


FIG. 2. Water permeability of cellulose membranes. Material C.

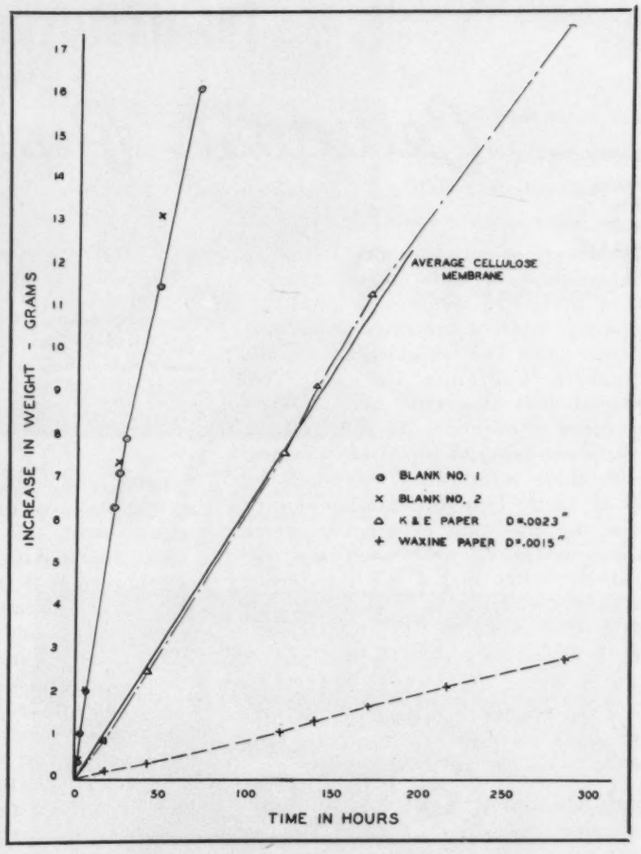


FIG. 3. Water permeability of various materials.

operation. Two more cells are made up using a membrane which has been applied to the pipe as a third layer (between the two usual layers) and then removed and tested. The purpose of these last four cells is to determine any effect the heat of the asphalt might have upon the rate of water vapor permeability of the membrane. The operations described will render the sample ready for test.

The cells so prepared are exposed to an atmosphere of 100° F. and 90% relative humidity by placing in a special oven maintained at the above conditions (Fig. 1). The cells are subjected to the temperature and humidity of the test for two hours before making the initial weighing to allow the cells to reach equilibrium. The cells are then reweighed each working day for one week; then twice a week for the next three weeks or until all of the surplus solid $CaCl_2$ in the bottom of the crystallizing dish is consumed.

The increase in weight (if any) is tabulated and plotted versus the corresponding elapsed time in hours. Fig. 2 shows results of one test.

It will be noted, when Figs. 2 and 3 are compared, that the amount of water gained by the cells containing membranes is about one-fifth the amount of water gained by the "blank" cell containing no membrane. Test curves for Keuffel and Esser graph paper and "Waxine" waxed paper are also plotted in Fig. 3. It must be remembered that the thicknesses of these materials are much greater than that of the cellulose membranes used in pipe wrapping and that the driving force (V.P.D.) across the membrane is very much greater in this test than when the membrane is on the pipe in the ground.

In making tensile strength tests on a cellulose membrane, a standard tensile testing machine of small capacity, an approved paper testing machine or a specially constructed machine may be used. The Southern California Gas Co. tests were made with the equipment shown in Fig. 4 in an approved manner by loading a 1-in. wide and 6-in. long sample of 2-in. gage length at the rate of 640 grams per minute.

TABLE NO. 1. TENSILE STRENGTH TESTS AT 104° F..

Membrane	*Load at Failure, Lbs.*	*Tensile Strength, P.S.I.*
A	5.7500	6540
	6.0000	6820
B	5.0525	5750
	5.5000	6250
D	4.8750	5540
	5.7500	6540

Table No. 1 shows the results of some of the tests run on materials A, B, and D. The temperature at which these tests are run is quite important since the tensile strength decreases as the temperature increases.

Cellulose pipe wrappers are applied in the pipe yard over asphalt which is at temperatures as high as 340° F. Obviously, the softening point of the wrapper must be above the temperature of the asphalt. The A.S.T.M. procedure for the determination of the softening point of bituminous materials (6) was adapted.

In the softening point test, a section of membrane from a sample roll is placed between two 18-gage aluminum rings (I.D. of 1⅜ in., O.D. of 2 in.). Gaskets are used between the membranes and the rings to prevent the membrane from slipping. The rings are bolted together with six 1-in. long bolts which also form the supporting stand of the rings. The specimen is now placed in the bottom of a 600 cc. beaker so that the membrane is about 0.95 in. above the bottom. The standard A.S.T.M. ball is now placed in the center of the membrane and a 30° to 580° F. A.S.T.M. low distillation thermometer is suspended so that the bulb

TABLE NO. 2. SOFTENING POINT TESTS

Membrane	*Type of Bath*	*Softening Temp., °F.*
A	Mineral oil	388
		384
		386
		381
		392
		394
B	Mineral oil	394
		388
		394
	Transformer oil	384
		392
		392
C	Mineral oil	394
D	Transformer oil	354
	Mineral oil	396
		399
		395

TABLE NO. 3. COHESION TESTS

Membrane	*Remarks*
A	The membranes could be separated with only a little difficulty. Only a few holes were observed when viewed under the microscope. There are fewer holes in this membrane than in material B. A comparison of the heated and unheated membranes showed that the heated membrane had no more holes in it than the unheated one.
B	These membranes did not stick but seemed to be very "oily." The microscope showed the presence of several minute holes. There seems to be more holes in the membranes after heating than before.
C	These membranes became very brittle and could be separated only with some difficulty.

is directly above the ball and within ½ in. of it. The beaker is filled with Russian mineral oil so that the level of the oil is 1 in. above the membrane. The oil is then heated at the standard rate (9° to 11° F. per min.). The temperature at which the ball touches the bottom of the beaker is recorded as the softening point.

Although this test may not appear to be accurate enough for some purposes, it tells us very quickly if the material can be used as a pipe wrapper. Table No. 2 shows the results of some of these tests.

Cohesion tests are only comparative and are made to determine what happens if several layers of a membrane, in intimate contact with each other, are heated.

The cellulose membrane is wound several times around a metal cylinder (D = 4¼ in.) and then is placed in an oven at 300° F. for five minutes. At the end of the heating time the cylinder is removed and cooled with a blast of compressed air. The ease with which the membrane can be unwound from the cylinder is observed. The material is inspected and compared to the unheated cellulose film.

The theory of separation of the inner and outer layers of membrane, in order for the coating to resist soil stresses, demands that the layers of cellulose membrane shall not stick to each other. We inspect the membranes for this above characteristic, for an increase in the amount of microscopic holes, and for other pertinent information. Table No. 3 shows some of the results obtained with these tests on three materials.

It was decided, after due consideration, that a field test for shrinkage, such as the direct measurement of the lap and transverse and longitudinal shrinkage or elongation after the wrapper had been applied to the pipe, would be as simple but more exact than any test that could be run in the laboratory. In this field test the cellulose wrapper is first measured for width and thickness and then it is marked for every foot, on two separate rolls, for a length that will cover two lengths of pipe. The two measured and marked rolls are inserted in place on one of the portable pipe-coating machines. The asphalt temperature at the first asphalt spout on the machine (this spout produces the inside layer of asphalt on the pipe) should be about 310° F. for 2-in. pipe. The regular coating is applied to the lengths of pipe. The 150 ft. of marked 4-in. width membrane will cover about two lengths of 2-in. pipe. The coating is allowed to cool until it is almost cold, and then two 1-ft. sections of the outer cellulose wrapper, the outer layer of asphalt, and the wrap of Kraft paper are removed from each end of a length of pipe. The sections are numbered as they are removed. Measurements are now made on the inner wrap of cellulose wrapper in one plane only. The measurements of lap and transverse shrinkage are made in a straight line on one side of the pipe and then the pipe is rotated 180° and the observations are repeated. As many measurements of the longitudinal change in dimension are made as possible. These are made by winding a 4-in. strip of paper over the wrapper and measuring the distance from mark to mark. From this dimension the per cent longitudinal change in dimensions is computed.

The above procedure is repeated for the outer wrapper where measurements are taken at the cut and in the middle of the section of removed wrapper. The results of the numerous measurements are now averaged and then the net change in area of the membrane is computed. The cellulose membranes are ranked in order of increasing shrinkage, *i.e.*, the membrane exhibiting the least amount of shrinkage is the best, etc. In the membranes tested, a transverse shrinkage of from 0.05 to 0.8 in. was observed on original 4-in. widths.

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(1) "The Use of Cellulose Wrappers in Pipe Line Protection," H. G. Laub. Submitted to Bureau of Standards Soil Corrosion Conference, Washington, D. C., 1937.

(2) "Permeability of Cellulose Wrapping Materials," W. H. Church and A. G. Scroggie, Paper Trade Jl., Vol. 101, No. 14, Oct. 3, 1935, p. 31-9.

(3) "Permeability of Membranes to Water Vapor With Special Reference to Packaging Materials," Frederick T. Carlson, National Bureau of Standards Misc. Publication M127.

(4) "Permeability to Moisture of Synthetic Resin Finishes for Aircraft," Gordon M. Kline, National Bureau of Standards Research Paper RP974.

(5) "Factors Affecting the Determination of Water Vapor Permeability," A. Abrams and G. J. Brabender, Paper Trade Jl., Vol. 102, TS204, April 9, 1936.

(6) "Standard Method of Test for Softening Point of Bituminous Materials," American Society for Testing Materials, Designation D36-26.

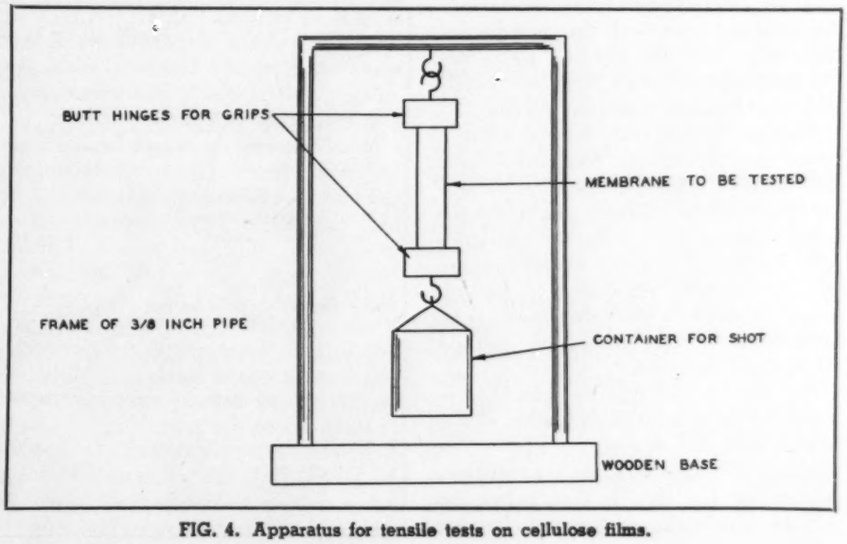


FIG. 4. Apparatus for tensile tests on cellulose films.

TABLE NO. 1. SUMMARY OF VEGETATION SURVEYS

	Total — All Properties
Miles main in system (all properties)	3879
Miles covered	3088
No. days on survey	200
Large leaks located	276
Medium leaks located	1098
Small leaks located	2453
Total leaks located	3827
No. trees injured by gas	501
No. shrubs injured by gas	250
No. sq. ft. lawn injured by gas	57753
Payment to Forestry Service	6148.24
Additional cost of survey	1250.10
Total cost of survey	7398.34
Average miles covered per day	15
Average no. leaks located per mile	1.27
Average cost per mile	2.50
Average cost per leak	2.00

• **E. O. WERBA, Georgia Public Utilities Co., Atlanta, Ga., in a paper, "Results Obtained from the Vegetation Method of Locating Gas Leaks," presented before the Technical Section at the Annual Convention of the Southern Gas Association held at Arlington Hotel, Hot Springs, Ark., February 12-14, 1940. — (Abstract by G A S.)**

The VEGETATION METHOD of Locating Leaks

SEVERAL years ago one of the companies specializing in the care and preservation of tree and plant life conceived the idea of detecting gas leaks for gas companies through inspection of vegetation such as grass, shrubbery, bushes and trees in the vicinity of gas mains or services. Experts employed by these various forestry service companies have been trained to recognize the effects of gas leakage on the various kinds of vegetation which may be located in the vicinity of a gas leak. In addition to the general knowledge that the tree experts usually possess, a number of selective individuals are chosen from the staff of experts and are then given intensive courses in the subject of gas leakage and its effect on vegetation. At present, many of the companies that offer forestry service have developed expert crews who are available for leakage detection service.

During the last two or three years a great number of gas companies have had surveys made by the forestry service companies. Several reports have been received from various companies who have had surveys made and the general opinion expressed in the reports received is favorable toward the utilization of the vegetation method of leakage detection.

In one of the reports which were received from a large property, it was stated that the vegetation survey for leakage detection has one very distinct advantage and that is that public relations are improved through the use of this method. This method of leakage detection is not so conspicuous as the standard bar survey method and requires little pavement breakage.

The vegetation method of leakage detection, as summarized in Table No. 1 shows a lesser cost per mile than any other standard system. The cost of a survey seems to run in the vicinity of $2.00 per mile. The Georgia Public Utilities Co. has decided to make this survey an annual affair. We feel that, unless we performed some systematic leakage work annually, excluding of course those particular distribution systems which are new, we should be negligent to the public.

We operate properties in the South in various geographical locations where all kinds of vegetation and soil conditions exist. Our experience has shown that best results have been obtained when surveys were made just *after* the period of maximum vegetation vigor. In periods of extreme drought very poor results were obtained. In some of the coastal properties where sandy soil and live oaks are frequent, we have found results to be not satisfactory. Leakage of butane-air gas, due to its large oxygen content, is not so easily detected.

The vegetation method of survey is satisfactory in small properties where no special crew is constantly working on unaccounted-for gas.

TABLE NO. 2. VEGETATION SURVEYS

	Property I	*Property K*		*Property L*
	1938	*1937*	*1939*	*1937*
Miles main in system	24	107	901	117
Miles covered	24	90	361	117
No. days on survey	2	12	27	15
Large leaks located	3	2	30	9
Medium leaks located	3	35	106	156
Small leaks located	18	97	408	155
Total leaks located	24	134	544	320
No. trees injured by gas	9	30	101	.....
No. shrubs injured by gas	2	5	78	.....
No. sq. ft. lawn injured by gas	280	3629	4619	.....
Payment to Forestry Service	62.10	348.10	826.08	473.05
Additional cost of survey	7.85	.....	.....	.....
Total cost of survey	69.95	348.10	826.08	473.05
Miles covered per day	12.0	7.5	13.4	8.0
No. leaks located per mile	1.00	1.50	1.50	2.00
Cost per mile	2.91	3.87	2.29	4.00
Cost per leak	2.91	2.60	1.51	1.45

The expert from the Forestry Service company usually rides around through the town on the running board of a car and observes very carefully the vegetation. When he reaches a place where the vegetation looks suspicious, he has the car stopped and makes a few bar holes and determines the location of the leak. Then he classifies the leak in respect to seriousness and size. The mileage he covers per day is limited by the number of stops he has to make. Usually one employe of the gas company, who knows the location of the mains, drives the car for the surveyor. After the survey is completed, a detailed report is given the gas company and, if any shrubbery has been injured by gas, it is also stated on the report. A sketch is also included showing the leak location.

In the downtown sections in a few of the large towns which we serve, very little vegetation exists, so the vegetation method of leakage detection in the business districts is not effective. Other means of survey will have to be used in the immediate downtown sections. In most of the properties in which we have distribution systems, vegetation and parkways can be found in almost all of the downtown sections. Consequently the vegetation method can be 100% effective. A tabulation of the results obtained in the various properties through the vegetation survey method is shown in Table No. 2. The average cost of the survey per mile is $2.50; the cost per leak, about $2.00.

To summarize briefly, based upon all of the reports received from representative properties, the vegetation method of leakage detection appears now to be an accepted service by a very large number of gas properties and it has the following advantages:

1. Very low cost per mile.
2. Speed of completion.
3. It is not conspicuous and will improve public relations because of the simplicity and speed of the method.
4. This method offers a way of relieving existing small organizations from the responsibility of laborious surveys and permits time to complete the general routine daily work more easily and effectively.
5. It provides a very economical method of leakage correction and pays a very nice return on the money invested in the survey.
6. It gives a systematic and accepted standard method of leakage correction which should combat accusations of negligence and damage suits.

FIG. 1.
A typical input well used for pressure maintenance in Osage County, Okla. Note the method of connecting 2-in. line to tubing head.

Maintaining Pressure By Gas Injection In Oklahoma's South Burbank Pool

ENGINEERS of acknowledged reputation have demonstrated in various parts of the world that, by maintaining pressure on oil producing sands by gas injection, a greater ultimate recovery of oil is possible. Likewise, many old and depleted oil fields have been re-pressured with injected gas and their life profitably prolonged.

Several pools in Oklahoma have been repressured with gratifying results after the reservoir pressure had been dissipated, hastened in some instances by applying a vacuum on the wells, but only a small number have been operated throughout their life with pressures maintained upon the sands by the injection of gas. Among the few fields operated under a program of pressure maintenance is one in Osage County, locally known as the South Burbank Pool. This pool has been operated almost four years as a community project with a member company managing and operating the unitized block of leases. The producing structure has been described as a lenticular monocline, and sands as the Burbank Sand, which was laid down as an ancient shore line of an inland sea. The pool was discovered on December 28, 1933, by the Mead Oil Co.

Subsequent wells were drilled by the individual lease owners until the properties were pooled in a unitized block to be operated as a project known as South Burbank Unitized Block, Community 42. The object of unitizing the properties was for the purpose of operating the existing wells, and others to be drilled, by maintaining as much pressure in the reservoir as possible by returning gas to the sand after it had been processed to recover the available natural gasoline fractions. A survey of the field disclosed the fact that the subsurface pressures averaged approximately 1050 lbs., and that a well defined gas cap extended along the east side of the proved area, lying in the highest part of the structure which provided sufficient formation energy for the wells to flow naturally. This area, therefore, produced the greatest gas-oil ratio of the field, and it was decided, after the survey was completed, that the gas to be returned to the formation would be injected into this area.

Original Wells Used

At the time the pressure maintenance program was instituted, some of the original wells, and others drilled for the purpose, were equipped for returning the gas to the sand. The injection wells were completed in the same manner as oil producing wells and equipped with tubing extending down into the productive zone so the gas could be directed into the sand. Each injection well is subjected to frequent analysis, together with the producing wells, to determine if and when the injection wells should be changed from input to producers. Likewise, as the gas cap advances across the property as the oil is removed, producing wells may be pressed into service as injection wells.

At this time, the two gasoline plants

erected in the area are processing approximately 810,000,000 cu. ft. of gas monthly, operating with an absorption pressure of about 175 lbs., so the residue gas may be delivered to the compression plant for injection into the sand. The station, or gas compression plant, contains seven 230 h.p. twin gas engine driven compressors which take suction on the dry gas transmission line connecting this plant with the two gasoline plants. The compression of the gas from the intake of around 170 to 175 lbs. to that required for injection into the input wells is through one stage only, utilizing compressor cylinders with a bore of 5½ in. and a stroke of 20 in.

The dry gas from the gasoline plants enters the compressor station grounds through a vertical vessel equipped as a scrubber to remove any foreign matter. The process of scrubbing the gas includes washing with oil, a sufficient amount of which is retained in the base of the vessel to accomplish this phase of operation. The scrubber is equipped with internal baffles to prevent carry-over of oil and other substances, and connected at the top of the vessel directly to the compressor intake header.

A Common Header

All engines discharge into a common header which continues into the field as a distribution main. Manually operated release valves were installed outside the building so that the cylinders of any engine may be purged of gas when it is necessary to take the unit out of service. The fittings on this system, as well as those on other parts of the station are all forged steel built to operate at a pressure of 2,000 lbs.

The transmission system leaving the compressors is a 6⅝ in. pipe line laid through the field with smaller lines branching off at intervals to the injection wells. Two-inch pipe is used to connect the individual well with the pressure system. (See Fig. 1.) By the use of orifice meters with recording charts, each well is governed as to its intake volume in relation to its location in the pool.

Each of the injection wells was located at a point in the structure where gas injection exerts the greatest driving force upon the oil in the sand without channeling through to a producing well. To prevent the occurence of channeling, formation packers have been installed on the tubing of producing wells to exclude as much gas as possible and yet recover the amount of oil the well is required to produce.

The formation pressure naturally has a tendency to reduce as the field is relieved of its oil, but this reduction has been a gradual one, averaging about 25 lbs. for each 1,000,000 barrels of oil produced since the pool was placed on a pressure maintenance program. The pool is surveyed twice yearly to obtain data on subsurface conditions so that the input gas can be governed and the producing wells shifted over the area. By shifting, wells that indicate an abnormal gas/oil ratio are shut in, or equipped with subsurface fittings, (such as formation packers), to relieve the condition.

Average Volume Returned

The average daily volume of gas returned to the formation through eight wells used for injection purposes is about 12,000,000 cu. ft. at a mean well-head pressure of approximately 620 lbs. per sq. in. Since the unit was formed as Community-42, the total amount of gas returned to the sand ranges between 13 and 14 billion cu. ft. The amount of oil that has been recovered from the Community Block is in excess of 14,600,000 barrels with a net gas/oil ratio of 736 cu. ft.

Due to the maintenance of pressures by return of gas to the sand, all but eight of the producing wells are flowing wells. Those not flowing are situated in portions of the area of low initial pressure and are not affected materially by the return of gas to the formation. Since the field is over five years old, the benefits of maintaining reservoir pressure can be appreciated when it is known that only slightly over seven per cent of the wells in the block require mechanical means for lifting the oil to the surface.

CALENDAR

April

American Gas Association Accounting Section—Spring Conference, White Sulphur Springs, W. Va., April 11-12.

Gas Meters Association — Hollywood Beach Hotel, Hollywood, Fla., April 21-23.

Maryland Utilities Association—Annual Meeting, Lord Baltimore Hotel, Baltimore, Md., April 5.

Mid-West Gas Association — Annual Convention, Lincoln, Neb., April 15-17.

Midwest Power Conference—Third Annual Meeting, Palmer House, Chicago, Ill., April 9-10.

Missouri Association of Public Utilities—Annual Convention, Elms Hotel, Excelsior Springs, Mo., April 17-19.

New Jersey Gas Association—Annual convention, Asbury Park, N. J., April 9.

Pacific Coast Gas Association Spring Technical Conference—Embassy Auditorium, Los Angeles, April 11-12.

Southwestern Gas Measurement Short Course—College of Engineering, University of Oklahoma, Norman, Okla., April 16-18.

May

American Gas Association Distribution Conference—Houston, Texas, May 6-10.

American Gas Association Joint Production and Chemical Conference—Hotel Pennsylvania, New York City, May 20-22.

Association of Gas Appliance and Equipment Manufacturers—Annual Convention, French Lick Springs Hotel, French Lick, Ind., May 20-22.

Indiana Gas Association—30th Annual Convention, Evansville, Ind., May 13-14.

International Petroleum Exposition and Congress—Tulsa, Okla., May 18-25.

Natural Gas and Petroleum Association of Canada—17th Annual Convention, Hotel London, London, Ontario, May 30-31.

Natural Gas Section, A. G. A.—Annual Convention, Houston, Texas, May 6-10.

Natural Gasoline Association of America — Annual Convention, Hotel Tulsa, Tulsa, Okla., May 15-17.

Pennsylvania Gas Association—Annual Convention, Skytop, Pa., May 14-16.

June

American Home Economics Association—Hotel Statler, Cleveland, Ohio, June 23-27.

July

Canadian Gas Association—Annual Convention, Jasper Park Lodge, Alberta, July 3-5.

Michigan Gas Association — Annual Convention, Grand Hotel, Mackinac Island, Mich., July 8-10.

Pacific Coast Gas Association Northwest Conference — Held in conjunction with Canadian Gas Association, July 3-5.

August

Appalachian Gas Measurement Short Course—Third annual meeting, University of West Virginia, Morgantown, Aug. 19-21.

September

Empire State Gas and Electric Association—Annual Convention, Westchester Country Club, Rye, N. Y., Sept. 26-27.

Pacific Coast Gas Association—Annual convention, Hotel del Coronado, Coronado, Calif., September 18-20.

October

American Gas Association — Annual Convention, Atlantic City, N. J., week of October 7.

December

National Association of Railroad and Utility Commissioners—Miami, Fla., Dec. 10-12.

■ ■

Texas Cities Co. Plans Galveston Improvements

The Texas Cities Gas Co., Dallas, has launched an expansion program for its Galveston county holdings that calls for expenditures totaling $130,000, P. E. Nicholls, Galveston manager, announced. The program does not include the $55,000 office building, into which the company moved last month.

Mr. Nicholls said the construction program called for the replacement of 9800 ft. of pipe line across Galveston Bay and the replacement of 5000 ft. of 14-in. pipe line on the mainland. Also included in the program are a new main extension line, new service lines, new meters and extensive repairs to the firm's distribution plant in Galveston.

■ ■

Citizens Utilities Co. Buys Colorado Gas Properties

The sale of the gas distribution system of the Arkansas Valley Natural Gas Co., Colorado Springs, Colo., has been made to the Citizens Utilities Co., a Delaware corporation, for $35,000, according to a report of the Colorado State Public Utilties Commission.

The deal involves gas distribution facilities in the following Colorado towns: Ordway, Las Animas, Sugar City, Manzanola, and Fowler. The Citizens Utilities Co. already serves La Junta, Rocky Ford and Swink.

NEXT MONTH, gas men from the East, the West, the North and South will turn toward Houston as delegates to the American Gas Association's 35th Annual Natural Gas Section Convention and 17th Annual Distribution Conference.

Air-minded delegates will have this view of Houston when they soar in to the combined meetings of A.G.A.'s Natural Gas Section Convention and the Annual Distribution Conference.

Convention Preview

WHEN the 35th annual Natural Gas Convention meets on May 6-10, it will be the first time that this group of natural gas men has met in Houston, Texas. It will also be the first combined meeting of the Natural Gas Convention with the American Gas Association's Distribution Conference which is holding its 17th annual meeting. It is expected that this joint meeting will draw a record attendance from all parts of the United States and Canada.

Houston is a logical setting for a natural gas convention. It is an important city centered in one of the greatest natural resource territories in the world and its inspiring growth and continued expansion match that of the natural gas industry. Houston is also a beautiful city and exceptionally well fitted to receive a large convention. In addition, a trip to Houston makes possible interesting vacation visits to other famous sections of the Southwest and brings the Mexican border close enough to make a visit there practical.

The Natural Gas Convention program has been designed along practical lines and carefully planned to cover all phases of the natural gas industry so that every executive and employe may know what his industry has accomplished up to now and intends to accomplish in the future. Many of the papers are the result of years of research.

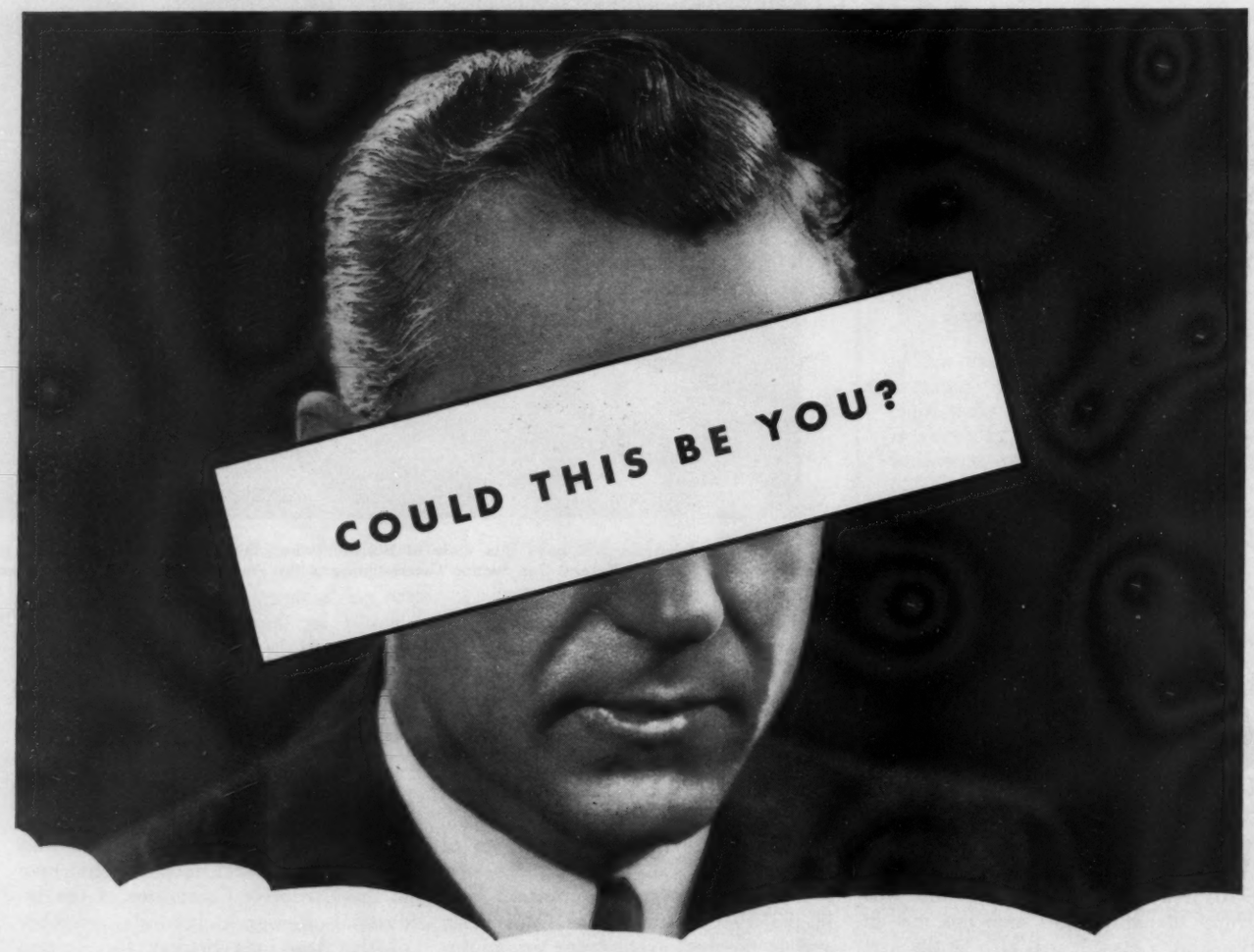
Research plays an important role in the 1940 Natural Gas Convention and is the background for an important address at the general session on May 7. At that meeting Herbert E. Graham, director of Metallurgy and Research for the Jones & Laughlin Steel Corp. in Pittsburgh will speak on the "Contribution to the Natural Gas Industry by Research in the Steel Industry." Mr. Graham is at the head of a department which during the past year or so has attracted the attention of the entire steel industry and steel consuming industries as well. The most recent development, which created a sensation in the industry, was the invention by his department of the first scientific control ever applied to the production of steel by the Bessemer process. Under Mr. Graham's direction, this department, about a year ago, established a Pilot Plant Research Laboratory with miniature steel furnaces, rolling mills, and other steel making and finishing equipment. In this first and only Pilot Plant in the steel industry, formulas and controls are developed and proved before they are applied commercially, successfully bridging the gap between research and production.

In addition to his many duties with Jones & Laughlin, Mr. Graham is active in various technical organizations and societies, which include: chairman of the Executive Committee of the Industrial Research Institute, member of the American Society for Testing Materials, American Society for Metals, American Institute of Mining and Metallurgical Engineers and others, including institutes in several foreign countries.

Research will also be the basis for an address by Frank C. Smith, president of the Houston Natural Gas Co., and chairman of the American Gas Association's Committee on Fundamental Research, and by Howell C. Cooper of the Hope Natural Gas Co. in Pittsburgh and chairman of the Natural Gas Section's Main Technical and Research Committee.

In addition to the comprehensive sales programs of the Domestic and Industrial Natural Gas Sales Conferences with papers concerning all phases of resident, commercial and industrial sales presented by leaders in the industry are the Transmission and Production Conferences which are of particular interest to operating men.

The Production Conference this year will feature a Symposium entitled "Our Experiences with the Underground Storage of Gas." This subject will be discussed by such authorities as Carl U. Daniels, vice president of the Oklahoma Natural Gas Co. in Tul-



This Man Has a Strange Ailment

THIS MAN HAS A STRANGE AILMENT. Some commercial managers suffer from it. The ailment is called *"heating appliance myopia"* (a form of merchandising *nearsightedness*). Its chief symptom is a "blind spot" about floor furnaces.

This commercial manager will tell you frankly that he can't see floor furnaces. His company doesn't sell them... doesn't profit from them.

Up to now neither he nor his company has checked to find out why so many other utilities give floor furnaces a major place in their selling programs. Nobody yet has asked why those other companies should enjoy floor furnace profits and permanent space heating load that his company is missing. But, sooner or later, that question will be asked, because every year the floor furnace gains an increasingly important position in service to the gas industry and its consumers.

A floor furnace is dependable. It delivers maximum heat *instantly.* It automatically or manually *controls temperature* as desired. It is *convenient*... requires no attention. It is *inconspicuous*... hidden out of the way beneath the floor line with only register showing in the room.

Floor furnaces will do a whole ground floor heating job through installation of two or more units. In many areas where conditions prevent use of basements for major plants, the floor furnace solves the problem. A floor furnace is the only practical means of putting gas heat in many

existing homes. No installation problems. Just drop furnace into floor opening, attach to vent and gas line and *the home is yours.*

For many medium and lower income homes, where first cost is a problem, a floor furnace will get you in. Additional installations later spread the advantage of gas heat to the entire house.

In homes equipped with major plants, the floor furnace is ideal *auxiliary* heat for early fall and late spring. Also as *supplementary* heat for special rooms or difficult-to-heat areas.

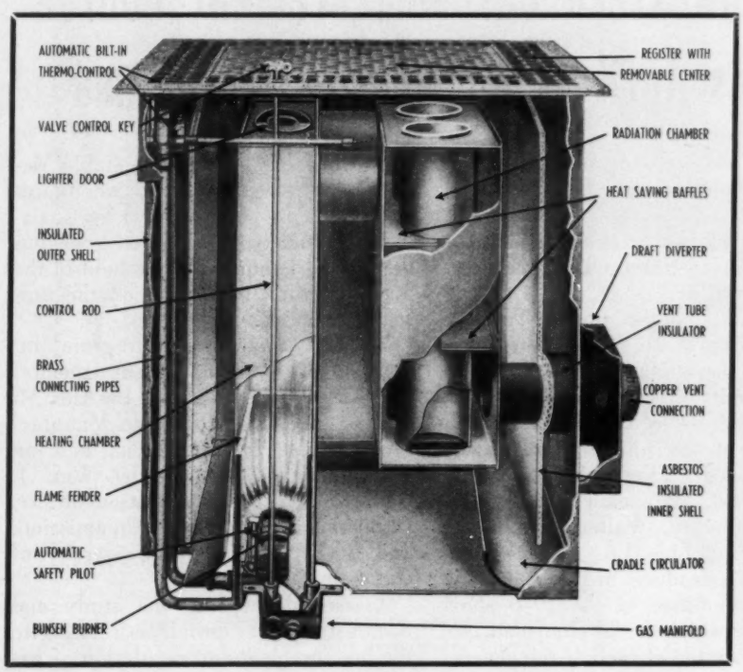
• • •

If you are a commercial manager who has been troubled with floor furnace "blind spots," don't give up hope. Severe cases have been "cured" and today are *enthusiastically* and *profitably* floor-furnace-minded.

The first step in the treatment consists of looking intently at the pages of current floor furnace catalog of the Ward Heater Company. We've been building floor furnaces for 31 years... and we can help you do a successful load building job with them, just as we are successfully serving many other companies. We prescribe a Ward catalog and we'll be glad to fill that prescription promptly. Why not write today?

P. B. Logue

VICE-PRESIDENT AND GENERAL MANAGER



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sa; Fenton Finn, geologist of The Peoples Natural Gas Co., Pittsburgh; Porter D. Mellon, general superintendent and chief engineer of the Canadian Western Natural Gas, Light, Heat & Power Co., Calgary, Alberta, Canada; and by J. H. Newlon, geologist and superintendent of production for the Equitable Gas Co., Pittsburgh.

Coupled with this timely symposium will be a paper by S. A. Chadwell of The Ohio Fuel Gas Co., Columbus, Ohio, on "Natural Gas Storage and Its Effect on Transmission Operations." The second session of the convention's Production Conference will feature a symposium on "Drilling Beyond the First Mile" and will be presented by C. E. Reistle of the Humble Oil & Refining Co., Houston; H. P. George, Southern California Gas Co., Los Angeles; and H. A. Wallace, Jr., of the United Fuel Gas Co., Charleston, West Virginia.

Transmission Conference

The Transmission Conference will be made up of a group of up-to-the-minute papers on advanced phases of pipe line construction and operation among which are:

"Radio Communication for Dispatching and During Emergencies," W. T. Bulla, superintendent of Telephone and Pressure, Natural Gas Pipe Line Co. of America, Chicago, Ill. "Use of the 'Go-Devil' for Improving the Flow Efficiencies of Natural Gas Pipe Lines," C. H. M. Burnham, chief engineer, Panhandle Eastern Pipe Line Co., Kansas City, Mo.

An interesting paper dealing with gas engines and compressor operation will be delivered by B. L. Rogers and O. H. Moore of the Lone Star Gas Co., Dallas, Texas, on the subject, "Four Point Control in the Operation of the Four Cycle Natural Gas Engine."

Construction and operating features of major pipe lines will be handled by H. J. Carson, vice president of Northern Natural Gas Co., Omaha, whose subject is "Large Welded Pipe Lines."

These and many other papers of a practical nature will bring the pipe line operator up to date on all the technological advances in the operation and construction of pipe line systems used for natural gas transmission.

Many new uses have been found for natural gas in industrial plants during the past few years and H. O. Loebell, one of the outstanding engineers in the business, will present a paper on the subject, "Improvements in Industrial Processes Through Advancement in Heat Application."

For those interested in distribution, the Program Committee has worked out a well-balanced program on all phases of this important part of the natural gas business.

With a four day program of the calibre illustrated above, it is believed that the 1940 Natural Gas Convention will prove to be one of the most alive and informative meetings ever held and every natural gas man will want to plan to be in Houston from May 6-10. The Rice Hotel is Headquarters.

Southwestern Gas Measurement Course Opens April 16 at Norman, Oklahoma

PROGRAM arrangements for the 1940 Southwestern Gas Measurement Short Course were completed at a meeting of the program committee at the Biltmore Hotel, Oklahoma City, Okla., March 4.

The short course opens Tuesday morning, April 16, for a three-day period in the engineering building at the University of Oklahoma, Norman, with an address by Dr. W. B. Bizzell, president of the university. He will be introduced by Frank B. Long, Tulsa, president, Oklahoma Utilities Association. Fay C. Walters, Panhandle Eastern Pipe Line Co., Kansas City, Mo., will introduce members of the general committee of the 1940 short course, of which he is chairman. He also will preside at each of the general sessions to be held Tuesday, Wednesday and Thursday mornings in the college of engineering auditorium.

In addition to Dr. Bizzell general session speakers Tuesday will include R. M. Scofield, Lone Star Gas Co., Dallas, Texas; William F. Lowe, Tulsa, secretary, Natural Gasoline Association of America; E. H. Poe, New York City, secretary, Natural Gas Section, A.G.A., and E. F. Schmidt, vice president, Lone Star Gas Corp., Dallas.

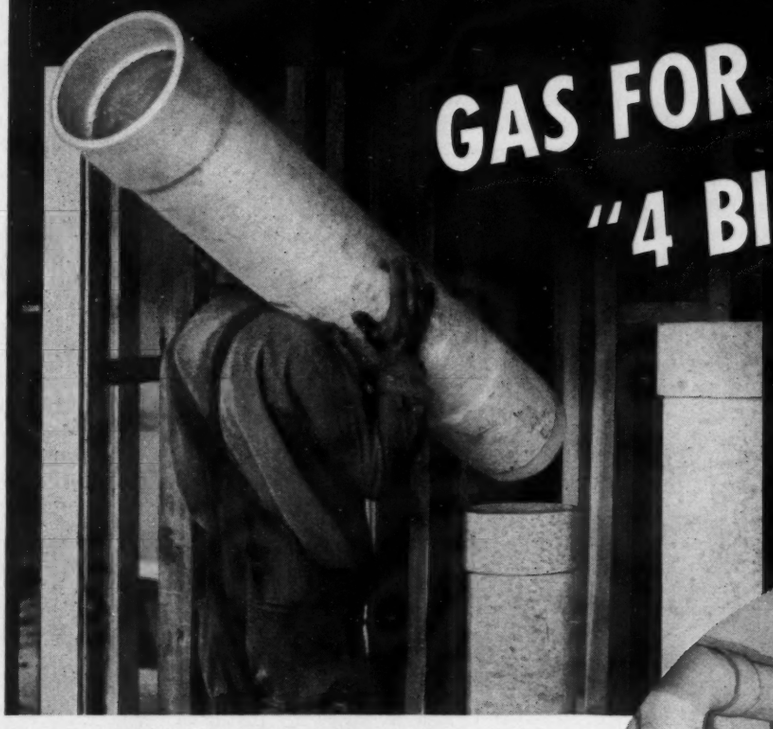
The Wednesday morning program will include addresses on "Fundamental Principles of Orifice Meters," by A. F. Benson, American Meter Co., Inc., New York; "Fundamental Principles of Displacement Meters," by A. D. MacLean, Pittsburgh Equitable Meter Co., Pittsburgh, Pa., and announcement of 1939 prize papers, by Chairman Walters. On Wednesday evening the annual banquet will be held in the Student Union ball room on the university campus.

Thursday morning's program includes addresses on: "Fundamental Principles of Regulators," by Alex M. Brooks, The Chaplin-Fulton Manufacturing Co., Pittsburgh, Pa., and on yet unassigned subjects by Wm. J. Armstrong, chief conservation officer, Oklahoma Corporation Commission, and R. L. Huntington, University of Oklahoma.

Classes devoted to the study and demonstration of problems relating to the measurement and regulation of gas will be held on each of the three afternoons. Speakers at these sessions will be members of the faculty of the college of engineering, University of Oklahoma, representatives of the gas and oil industry and engineers of equipment manufacturers.

Sponsor of the short course is the University of Oklahoma, college of engineering, W. H. Carson, dean, assisted by the Corporation Commission of Oklahoma, Railroad Commission of Texas, Corporation Commission of Kansas, Oklahoma Utilities Association, Natural Gas Section, A.G.A., and Natural Gasoline Association of America. Eighteen equipment manufacturers have engaged exhibit space.

Helps KEEP CUSTOMERS SOLD on GAS FOR THE "4 BIG JOBS"...



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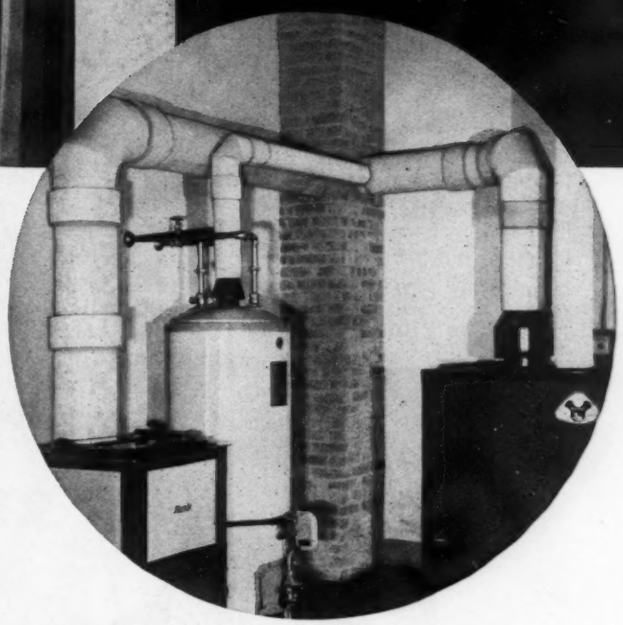
Customers appreciate the efficient, virtually trouble-free service of Transite Flue Pipe systems. You'll find their satisfaction works to sell more appliances. Why not get full details on this modern vent pipe? Write for Brochure TR-13A. Johns-Manville, 22 E. 40th St., New York City.



HIGHLY CORROSION-RESISTANT because of its asbestos-cement composition, Transite Flue Pipe keeps maintenance low. It gives dependable service that keeps customers sold on the convenience of using gas for the "4 big jobs."

AT THE NEW YORK WORLD'S FAIR
be sure to visit the J-M Building. And don't miss the interesting use of J-M Transite Flue Pipe in the American Gas Association Building.

Johns-Manville TRANSITE FLUE PIPE

The Industry Creates "Gas Wonderland" For 1940 New York Fair Visitors

GREATER variety and more drama and picturesqueness will characterize the gas industry's displays at the New York World's Fair this year as a result of extensive changes to make the exhibit even more popular than it was in 1939, according to word from Hugh H. Cuthrell, president of Gas Exhibits, Inc. The two-acre exhibit will be called "Gas Wonderland," a name that was chosen to typify the progress made by the industry in creating gas appliances and equipment that have wrought significant changes in home life, in commerce and industry, in recent years.

Though there have been retained a few of the features of the 1939 exhibit which attracted thousands of visitors, many new elements of showmanship have been introduced in staging the displays for this year. Two of the most unusual attractions for 1940 are the "Mystery Gardens" with their "singing" trees, and "Tiny Town," where the buildings "talk."

In a so-called "mini" basement is a model utility, play-room and kitchen in which all the various types of appliances that go to make up the ideal "all-gas kitchen" will be found, including a Servel Electrolux refrigerator and a CP range.

Some of the social and economic aspects of the use of gas to be shown by the exhibit include: The manner in which a newspaper plant can speed up its processes by drying ink quickly; the increase of all-year-round employment in a candy factory; the provision of unlimited quantities of clean linen in hospitals; tempering the cold water in swimming pools; cooling of beverages and preservation of foodstuffs through refrigeration, and protection of garments in dressmaking establishments. The use of gas for decorative illumination will also be shown.

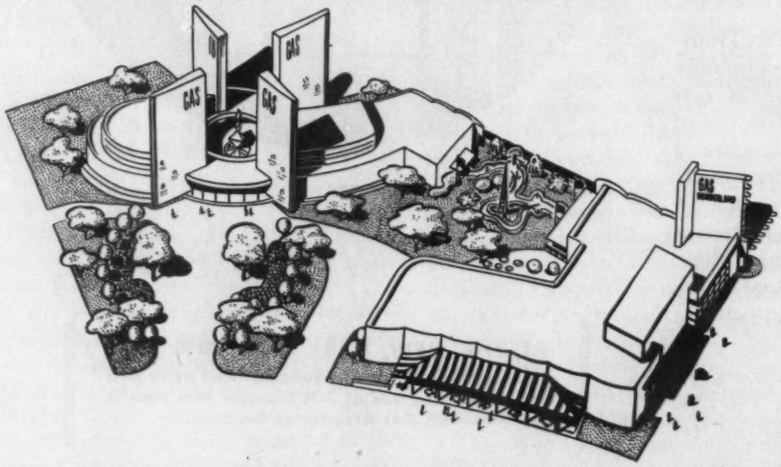
Located in the "Mystery Gardens" is a natural gas map, laid horizontally and constructed of terrazzo marble, with the individual states represented by different colors and which will show the natural gas distribution system throughout the nation. A high spot of the display will be a model of a gas well in Texas. Nearby, visitors will see an operating model of a derrick used in natural gas districts.

The four conspicuous 90-foot pylons within what was called last year the "Court of Flame" will be retained. These pylons are colored yellow, but at night they will be swathed in gas light. The gas flame torch from the upper corner of the giant mirrored cube will still be a feature of its nighttime lighting, the entire group of buildings being illuminated at night by high-powered gas flood-lights. A huge fin-like superstructure above the entrance pavilion bearing the words "Gas Wonderland" will guide visitors to the exhibit.

Election of the 1940 officers and members of the board of directors of Gas Exhibits, Inc., has been announced, this year's board being somewhat larger than that of 1939, with seven newly-elected members and eighteen members re-elected.

Hugh H. Cuthrell, vice president of the Brooklyn (N. Y.) Union Gas Co., was re-elected president. H. N. Ramsey, president of the Welsbach Co., Gloucester City, N. J., who was on the board in 1939, was elected vice president; N. T. Sellman, assistant vice president of the Consolidated Edison Co. of New York, re-elected treasurer, and Charles Nodder, of New York, elected secretary and comptroller.

Directors newly elected are: C. W. Berghorn, managing director, A.G.A. E.M.; N. B. Bertolette, president, Hartford (Conn.) Gas Co.; W. E. Derwent, vice president, George D. Roper Corp., Rockford, Ill.; W. F. Rockwell, president, Pittsburgh (Pa.) Equitable Meter Co.; F. J. Strickler, vice president and general manager, Kansas City (Mo.) Gas Co.; T. R. Weymouth, vice president, Columbia Gas & Electric Corp., New York, and H. Carl Wolf, president, Atlanta (Ga.) Gas Light Co.



"Gas Wonderland" will be the 1940 presentation of the Gas Industry at the New York World's Fair which opens again next month. At right is the entrance pavilion wherein will be the "Magic Caves of Ice"; to the left of the pavilion, the "Mystery Gardens"; upper left, the "Court of Flame" building which will house "Tiny Town" with its mechanically operated, miniature talking houses.

Accountants to Convene At White Sulphur Springs

The Spring Accounting Conference, sponsored by the American Gas Association, will be held April 11-12 at White Sulphur Springs, W. Va. H. B. Flahive, Columbia Gas and Electric Corp., New York City, is chairman of the section.

No function has been overlooked by the program committee to provide opportunities for unburdening ideas, discussing problems and gathering information on favorite controversial subjects. For instance, the problem of original cost, an important and timely one, is to be expounded from four angles—regulatory, management, legal, and engineering. The customer accounting and customer relations groups have scheduled meetings, of interest to all men in these fields.

The meetings are arranged for mornings and evenings, leaving the afternoons free for golf, tennis, horseback riding, hiking, etc.

Midwest Power Conference Planned for April 9-10

The third annual Midwest Power Conference will be held April 9 and 10 at the Palmer House, Chicago, sponsored by Armour Institute of Technology in cooperation with seven middle western universities and colleges, and several local and national engineering societies. One section of the program will be devoted to a discussion of "The Combustion Gas Turbine, a Prime Mover," with Paul R. Siddler, resident engineer of Baden, Switzerland, as the chief speaker.

Minneapolis Gas Light Co. Opens New Offices

The Minneapolis Gas Light Co. moved to their new offices last month. The company will occupy two floors in the building. Two model kitchens, a test kitchen and an auditorium, are included. The offices are air-conditioned.

Quiet as a Mouse . . . Smart as a Cat

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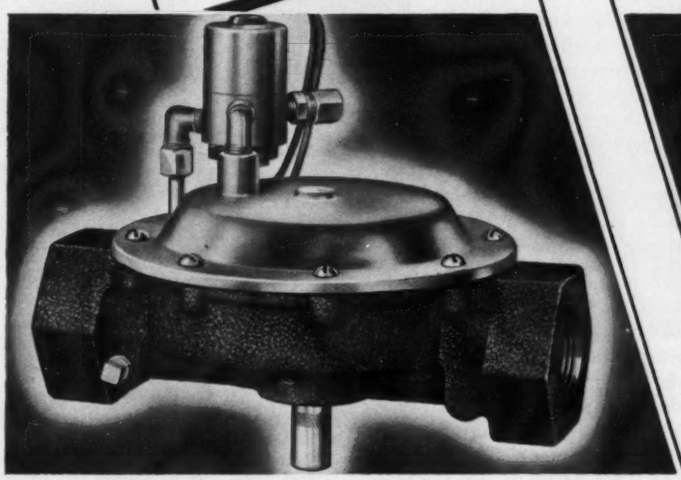

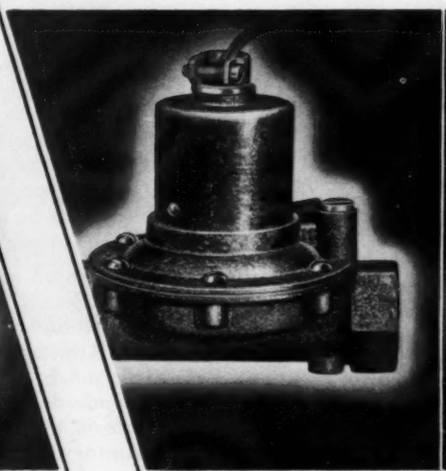

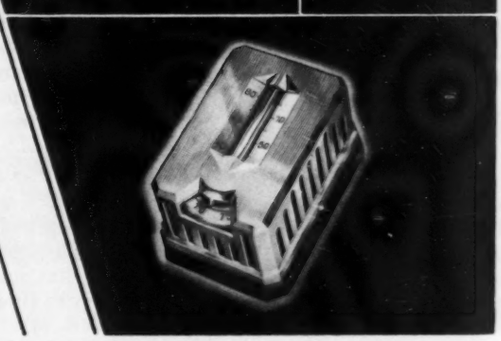

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When you use Klixon control valves and thermostats with gas heaters, you get more than accurate sensitive control. You also get smooth, quiet, trouble-free control.

Klixon electrically-operated gas valves are thermal throughout. A snap-acting thermostatic disc gives them their positive action. There are no solenoid or troublesome parts. You are relieved of sticking or humming. Moreover, they have an operating time delay that prevents false action.

Klixon gas valves, teamed up with Klixon Disc-operated Thermostats, make ideal control combinations. They are economical. They cut down service costs. And they are adaptable to all types of heaters and gas. Valve sizes range from $\frac{3}{8}$" to $1\frac{1}{4}$" IPS through 1000 cu. ft. Thermostats in several attractive models.

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Standards Association Accepts Revisions On Ten Sets of Approval Requirements

ON February 23, 1940, ten sets of recommended revisions to American Standard Approval and Listing Requirements for various gas appliances and accessories sponsored by the American Gas Association were adopted by the American Standards Association. These revisions bring up to date practically all current major gas appliance standards. They will become effective January 1, 1941.

Among the approval requirements recently adopted as American Standard are those for central heating gas appliances, clothes dryers, domestic gas ranges, hot plates and laundry stoves, gas space heaters, and gas unit heaters. The new American Standard listing requirements cover conversion burners, automatic pilots, and gas appliance thermostats. In addition, new American Standard installation requirements for conversion burners were adopted by the American Standards Association. New editions of these various revised requirements have just been published and distributed in the customary manner to all interested manufacturers.

In view of the large number of gas users who will be benefited, perhaps the most outstanding provisions incorporated in the new American Standards are those covering testing of central house heating appliances, space heaters, and unit heaters for use with bottled gases. During recent years there has been a considerable increase in the use of propane and butane gases as well as mixtures of the two, particularly in rural sections and where city gas lines have not yet been extended. As a result of satisfactory consumers' experience with domestic gas ranges and water heaters approved for use with these liquefied petroleum gases, there has been a corresponding increased demand for Laboratories' approval on other gas-burning equipment.

Additional requirements adopted by the American Standards Association make it possible for manufacturers to provide approved appliances for use with liquefied petroleum gases to these customers. With exception of gas refrigerator requirements, which will unquestionably incorporate similar provisions in their next revision, all major types of gas appliances may now be tested and approved in the Laboratories for use with liquefied petroleum gases. Similarly, provisions were incorporated to approve these appliances for use with butane-air gas.

Among the specifications incorporated to safeguard consumers' interests are requirements for suitable marking to indicate clearly the gases for which the appliance was approved. The statement "Approved for use only with Approved Liquefied Petroleum Gases" will show that the appliance was tested in the Laboratories for use with butane, propane or mixtures of these gases. The statement "Approved for use only with Approved Propane Gas (or Butane-Air Gas)" will clearly indicate that the appliance is certified only for use on the gas specifically named. In addition to indicating for which gas the appliance was designed, other informative statements are required on the name plates of the various appliances: unit heaters, for example, bear instructions covering their installation in garages, while furnaces are marked to indicate whether they are provided with means for forced circulation of warm air — all of which are self-explanatory to the purchaser and at the same time tend toward better gas service in consumers' homes.

Manufacturers will be interested in the simplification and clarification of the revised editions to these American Standards. Although the specifications were made much more rigid than the current standards, they reflect the progress made in the art of manufacturing satisfactory gas equipment. In the experience of the Laboratories, each modification adopted by the American Standards Association has been not only met by the manufacturers but additional improvements have been added as well.

Appliances complying with the 1941 requirements will provide safer, better constructed and more efficient gas-burning equipment than ever before, thus increasing their value to users of gas fuel.

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Shipments of Gas Ranges Outnumber Electric in 1939

Of the total gas and electric range shipments made during 1939, 81.72% were gas ranges, it has been revealed by data issued recently by the Statistical Department of the Association of Gas Appliance and Equipment Manufacturers. Gas ranges shipped totaled 1,327,100, and electric ranges 296,846. The ratio of gas range shipments to electric range shipments for 1939 stands at 4.47 gas to 1 electric, as compared with a ratio of 4.14 gas to 1 electric for the year 1938. Total gas range shipments for 1939 were 29.5% higher than those of 1938.

A similar analysis of the combined data on shipments of gas and electric water heaters reveals that 449,101 gas and 80,777 electric water heaters were shipped in 1939, making the ratio 5.56 gas to 1 electric. In 1938 the ratio was 5.83 gas to 1 electric. Total gas water heater shipments for the year 1939 exceeded those of 1938 by 29.1%.

At the end of 1939 the number of domestic gas customers, according to A. G. A. statistics, totaled 16.22 million. This is an increase of 1.9% over the number of customers at the end of 1938. New residential building permits issued in 1939 numbered 206,315, or 32.1% more than in 1938.

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E. R. Guyer, Cribben & Sexton Vice President, Is Dead

EDWARD R. GUYER, first vice president of Cribben & Sexton Co., Chicago, Ill., manufacturers of gas ranges, and immediate past president of the Association of Gas Appliance and Equipment Manufacturers, died suddenly on Monday, March 18, of injuries sustained in a fall. He was 48 years old. During his career in the manufacturing business he attained an enviable reputation as a brilliant executive. His first major executive position was as production manager of the Moline Plow Works; then as superintendent of the Rock Island Stove Co., and finally with Cribben & Sexton Co.

E. R. GUYER

Mr. Guyer was president of the Association of Gas Appliance and Equipment Manufacturers during 1938-39 and was also past president of the Manufacturers Protective and Development Association. At the time of his death he was a member of the Boards of the American Gas Association and the Association of Gas Appliance and Equipment Manufacturers.

Mr. Guyer was educated at the Hill School and was graduated from Cornell University in the class of 1915 with a mechanical engineering degree.

■ ■

Pacific Coast Gas Industry Reports Growth in 1939

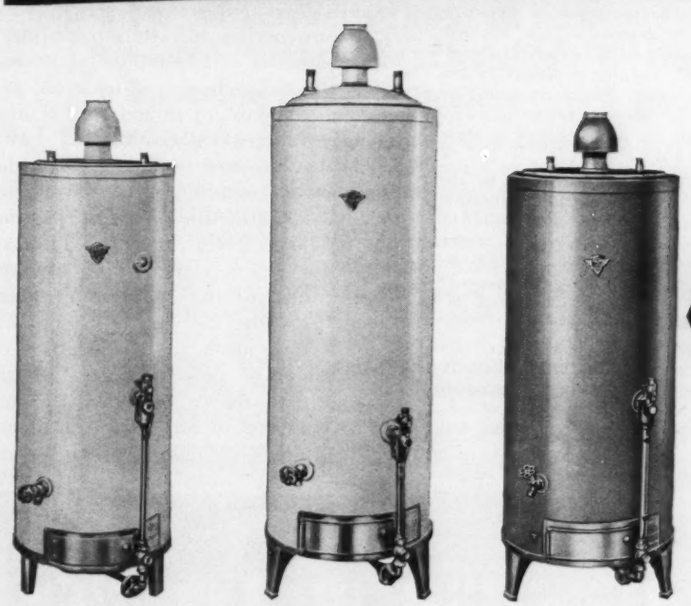
More than 70,000 new customers for gas service were gained during the year 1939 by the Pacific Coast gas industry, and cubic foot sales increased 13.9% over 1938 sales and 68% over 1929, it has been revealed in statistics recently issued by the Pacific Coast Gas Association. The number of gas consumers on the Pacific Coast as of December 31 totaled 1,963,342; the amount of gas sold reached 227,121,585 M c. f.; and the gross revenue amounted to $94,094,862. These statistics include Arizona, Nevada, California, Oregon, Washington, and British Columbia.

■ ■

New Owner for Menard Co.

The Menard (Texas) Gas Co., operating a gas system in that city, is now a privately-owned corporation. A. M. Russ heads the company as president, T. E. Mosheim, vice-president, E. D. Muir, secretary, and V. Clouse, general manager. The Gas Co. has announced that surveys will be made to determine possible gas line extensions.

MAKE A BIG SALES SPLASH THIS YEAR!
with these 3 brand new
AGP GAS-FIRED AUTOMATIC STORAGE WATER HEATERS
AGP
American Radiator & Standard Sanitary Corporation
GAS



NEW AGP BUDGET

Available with galvanized steel tanks of 15, 20, 30 and 40 gallon capacities. Jacket is finished in white enamel with aluminum trim. Sturdily built — priced low and specially suitable for small or low-cost homes.

NEW AGP CLIPPER

Available with galvanized steel tanks of 20, 30, 40, 60 and 75 gallon capacities. Jacket also finished in white enamel with aluminum trim. Slightly higher in cost it is perfect for homes in the higher price range.

NEW AGP DICTATOR

Available with strengthened copper tanks of 20, 30, 40 and 75 gallon capacities. A de Luxe Storage Water Heater for better homes, or where water conditions require the use of a copper tank.

NOW YOU can go after the Spring Water Heater business in a big way! For these 3 new **AGP** GAS-FIRED Storage Water Heaters have more features and more talking points to help you win sales whether your prospects' budgets are large or small.

Each is available in a comprehensive range of sizes and each embodies outstanding new improvements that make them even more efficient, dependable and economical in operation than ever before.

AMERICAN HEATING EQUIPMENT COSTS NO MORE THAN OTHERS

Write today for the full facts on these 3 fine new **AGP** GAS-FIRED Storage Water Heaters *—made and backed by the best known name in Heating and Plumbing—*

AMERICAN RADIATOR & Standard Sanitary CORPORATION

NEW YORK PITTSBURGH

Cast Iron & Steel Boilers & Furnaces • Radiators • Plumbing Fixtures & Fittings • Air Conditioners • Water Heaters Copper Pipe & Fittings • Heating Accessories

Copyright 1940, American Radiator & Standard Sanitary Corporation

California Railroad Commission Issues Order Controlling Gas Holders

THE Railroad Commission of the State of California, by their General Order No. 94, effective April 1, 1940, has established and prescribed a uniform procedure for the design, operation, maintenance and inspection of all gas holders and hydrocarbon vessels operated by public utilities in the state. It is believed that California is now the second state in the Union which exercises regulatory control over gas holders, the other being New York. The order was prepared by the commission's engineers acting in consultation with a committee of the Pacific Coast Gas Association.

General considerations for the design of holders, vessels, holder yards and vessel stations are as follows:

a. Holders or vessels should not be erected within 500 feet of public schools or other public assembly buildings with a seating capacity of over one hundred persons.

b. All holders, vessels, and aboveground piping and fittings adjacent thereto shall be properly surrounded by adequate fencing and gates that will prevent access by unauthorized persons.

c. Except as herein otherwise provided, all electrical wiring and lighting shall be installed in accordance with the requirements of the State Industrial Accident Commission's Electrical Safety Orders for Class 1-A hazardous locations, in effect at the time.

d. No holder or vessel shall, without authorization of the commission, be constructed or installed, the height of which is more than one twenty-fifth its distance from the nearest boundary of a licensed or lawfully established commercial or military aviation landing field. All holders or vessels shall be equipped with aviation beacons or warning lights.

e. No utility shall construct or install a holder or vessel above ground within fifty feet, or underground within twenty-five feet of an inflammable building or nearest adjoining property line that may have an inflammable building built thereon in the future, or from the nearest rail of a track on a railway private right of way. Also, no utility shall construct or install an inflammable building within one hundred feet of an aboveground holder or vessel or within fifty feet of an underground vessel. An inflammable building shall be understood to be a building, the roof or siding of which consists of wood or other readily combustible material.

f. Cupolas of waterless holders shall never be constructed of inflammable materials.

g. When a holder or vessel is constructed adjacent to any existing high tension electrical transmission line, it shall be located no nearer the lines than the height of the poles carrying them. For the purpose of this order, a high tension electrical transmission line is defined as one normally carrying voltages in excess of 50,000 volts.

h. A recording pressure gage shall be installed at the inlet or outlet of each high pressure holder, except that where a group of high pressure holders are jointly connected and are all filled from the same gas source and all empty into a common line or system, only one gage will be required.

A pressure gage will be required on each vessel.

i. The utility shall retain in its files any certificates of test and approval of vessels issued by the State Industrial Accident Commission.

j. At locations where inflammable buildings, dwellings, or materials are located within one hundred feet of holders or vessels, hydrants shall be provided within sufficient proximity for use in case of fire, except where such stations are sufficiently close to rivers or other sources of water, and pumping equipment for such water is provided.

k. Except as otherwise provided in the order, it is recommended that all high pressure holders and liquid hydrocarbon storage vessels be constructed in accordance with the provisions of the American Petroleum Institute — American Society of Mechanical Engineers Code — Unfired Pressure Vessels for Petroleum Liquids and Gases, in effect at the time of the construction.

l. Except as otherwise provided in the order, it is recommended that all high pressure holders and liquid hydrocarbon storage vessels be protected by pressure-relieving safety devices as set forth in paragraph W-600 and W-601 of the American Petroleum Institute — American Society of Mechanical Engineers Code referred to in "k" above, except that rupture discs shall not be permitted to serve such purpose.

Except as otherwise provided in the order, it is recommended that the location of stop valves between the pressure relieving devices and the holder or vessel, the capacity of the pressure relieving devices, and their methods of discharge be in accordance with paragraphs W-602, W-603 and W-604 of the same Code.

All pressure relieving devices on high pressure holders shall be tested after installation and before being placed in service to determine if they are of adequate capacity to meet all operating conditions.

m. All hydrocarbon vessels shall be provided with a pipe of small size, equipped with a valve at the end so arranged as to enable one to determine when the liquid level reaches the maximum permitted by the State Industrial Accident Commission's Liquefied Petroleum Gases Safety Orders in effect at the time. A metal tag or plate shall be attached bearing the words: "STOP FILLING WHEN LIQUID APPEARS."

n. Whenever a holder or vessel is to be partially or wholly buried underground, that portion exposed to the soil shall be reasonably protected against soil corrosion.

In the section on operation and maintenance, instructions are given as to supervisory and operating personnel, repairs of leaks and other maintenance work, fire protection, purging preparatory to and following repair work, and installation of aviation beacons. Particular attention is given to waterless type holders with respect to safety of operators when entering the holders for inspections; one man must remain on the upper landing or gallery so that he can be in constant communication with the men on the piston; all elevators, hoists, etc., must be inspected before use; adequate first aid and other protective equipment must be available.

All types of holders not already inspected in a manner satisfactory to the commission must be examined by competent outside inspectors, selected by the utility and acceptable to the commission. Additional and similar complete inspections must be made every 20 years on water seal and waterless holders, and high-pressure liquid hydrocarbon vessels, and every 10 years on high-pressure gas holders. In addition, daily, weekly, monthly, quarterly and annual inspections must be made in most cases, on standard sets of inspection forms prescribed by the commission.

A complete history of every gas holder and vessel operated by utilities in the state was supplied the commission in replies to a questionnaire sent to all gas utilities in August, 1936. The construction, installation, disposal or acquisition of any holder or vessel, as well as any change of location, appreciable repair, or remodeling of any such equipment after August, 1936, shall be reported in writing to the commission within 30 days after the effective date of this order. Beginning in January, 1941, and each January thereafter, each utility shall prepare and submit to the commission a report detailing the construction, disposal, acquisition, or installation of any holder or vessel, as well as any change of location, appreciable repair or remodeling of any such equipment taking place during the previous calendar year.

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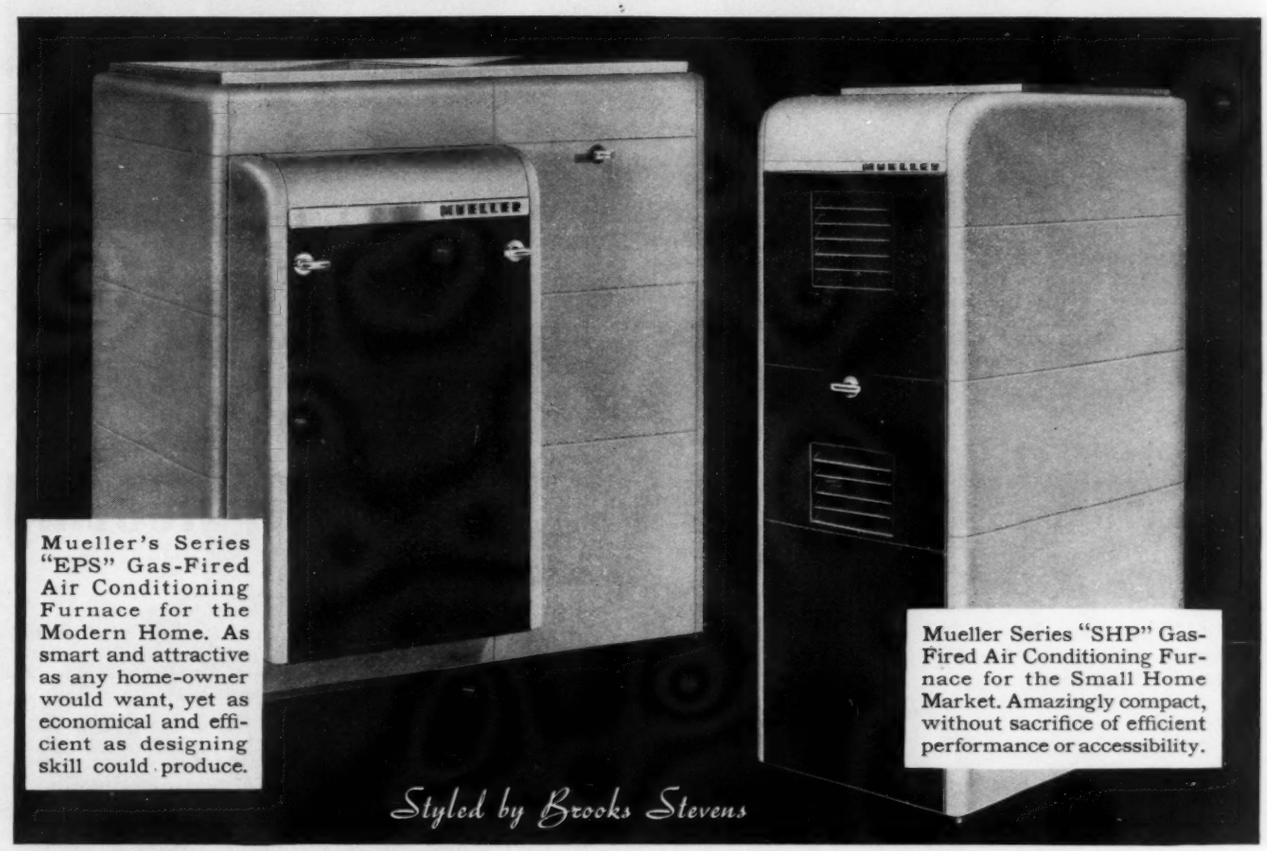
Hope Gas Co. Moves Office

Clarksburg, West Virginia, this month will become the main headquarters of the Hope Natural Gas Co., according to an announcement by L. L. Tonkin, president and general manager. Plans are going forward to move the Pittsburgh offices, and an addition is being made to the company's building in Clarksburg.

New MUELLER Gas Furnaces Designed and Priced for Small Home Market



Mueller's Series "EPS" Gas-Fired Air Conditioning Furnace for the Modern Home. As smart and attractive as any home-owner would want, yet as economical and efficient as designing skill could produce.

Mueller Series "SHP" Gas-Fired Air Conditioning Furnace for the Small Home Market. Amazingly compact, without sacrifice of efficient performance or accessibility.

Economy of Mueller's "EPS" De luxe Gas-Fired Furnace Opens Road to Increased Sales for Dealers

DESIGNING ingenuity and styling skill worked hand-in-hand to produce this unit...and produce it at economy prices. Into this unit have gone the many de luxe features for which Mueller has so long been famous . . . the Heat Speeder steel gas furnace section . . . the Climator Fan . . . the famous Safety Shut-off and many other Mueller achievements that make it possible for modern home-owners to enjoy the priceless comforts of gas heat . . . economically. Its low first cost is matched only by its amazingly moderate cost of operation. Get the facts—today!

"SHP" Gas-Fired Air Conditioning Furnace Fills Small Home Need for Compactness, Economy, Style

MUELLER'S Series "SHP" Gas-Fired Furnace embodies economy, performance and style in one small efficient "package". Ideal for the small home, it is as economical in operation as it is low in first cost.

The burner, of special design, with new adjustable air shutter, assures complete combustion, uniform flame distribution and quiet operation. "SHP" comes equipped with Mueller's famous Heat Levelizer, if desired.

Write today for complete information on this new Mueller unit for the Small Home Market.

L. J. MUELLER FURNACE CO., 2002 W. Oklahoma Avenue, Milwaukee, Wisconsin

MUELLER (m) MILWAUKEE

HEATING AND AIR CONDITIONING

SEND THIS COUPON TODAY

L. J. MUELLER FURNACE CO.,
2002 W. Oklahoma Ave., Milwaukee, Wisconsin
Please send me literature about
☐ Mueller "EPS" Gas-Fired Furnace
☐ Mueller "SHP" Gas-Fired Furnace

*Name*_____

*Address*_____

*City*_____ *State*_____

OFFICERS AND DIRECTORS of the New England Gas Association. FRONT ROW: A. C. Kenney, assistant secretary, Boston; Hall M. Henry, Cambridge; J. A. Weiser, Newport (incoming president); R. J. Rutherford, Worcester (retired president); C. G. Young, Springfield (first vice president); John West, Boston (second vice president). MIDDLE ROW: F. M. Goodwin, Boston; I. T. Haddock, Cambridge; G. W. Stiles, Portland; W. C. Slade, Boston; H. R. Sterrett, New Haven; C. H. Cummings, Boston; R. D. Stuart, Jr., Fall River; F. D. Campbell, Cambridge. BACK ROW: Clark Belden, executive secretary; M. J. Coughlin, Hartford; R. L. Fletcher, Providence; F. L. Ball, Boston; N. B. Bertolette, Hartford; A. E. Norton, Boston; L. E. Knowlton, Providence; R. D. Hawkins, Bridgeport; D. H. Levan, Lowell.

The New England Association's Annual Meeting

WITH a registration of 575 delegates and visitors the attendance at the 14th annual Business Conference of the New England Gas Association went over the top for the biggest meeting in a decade, and the largest registration ever polled since the policy of levying a registration fee was established.

March 14 and 15 saw this streamlined convention in full swing at Boston's Hotel Statler, with President R. J. Rutherford and his effective fellow officers, division chairmen and speakers moving briskly to keep pace with the full program set for the two days.

Thirty-six exhibitors held forth with displays of the latest products, and only during the hours when the business meetings were in session were the exhibit rooms closed. If there was an official closing curfew at night, nobody seemed to hear it.

• • •

The first order of business was the sales contest awards. This is a 15-year-old institution, and as John West pointed out, each year more companies participate. An all time record of 62 entries was established this year. Two outstanding companies in the sales contest field were the Buzzards Bay Gas Co. and the Nantucket Gas and Electric Co.

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Scheduled for five minutes on the program, the election of officers and directors for the ensuing year was accomplished in approximately nothing flat; the report of the nominating committee under the chairmanship of R. L. Fletcher was read and adopted by a unanimous vote. J. A. Weiser of Newport moved up from first vice-president to president. His fellow officers for the ensuing year are:

First vice-president: C. G. Young, Springfield Gas Light Co.; *second vice-president*: John West, New England Power Service Co., Boston; *treasurer*: F. D. Cadwallader, Boston Consolidated Gas Co.; *clerk*: Clark Belden, executive secretary, The New England Gas Association.

Directors-at-large: W. C. Bell, New England Power Association, Boston; N. B. Bertolette, The Hartford Gas Co.; F. D. Campbell, New England Gas & Electric Association, Cambridge; C. H. Cummings, The Industrial Appliance Co. of N. E., Boston; E. M. Farnsworth, Boston Consolidated Gas Co.; H. M. Henry, New England Gas & Electric Association, Cambridge; L. E. Knowlton, Providence Gas Co.; D. H. Levan, Lowell Gas Light Co.; A. E. Norton, Nathaniel Tufts Meter Works, Boston; H. B. Noyes, Manchester Gas Co.; P. J. Rempe, Stone and Webster Service Corp., Boston; D. S. Reynolds, Boston Consolidated Gas Co.; H. R. Sterrett, New Haven Gas Light Co.; G. W. Stiles, Portland Gas Light Co.

Ex-Officio Past Presidents: R. J. Rutherford, Worcester Gas Light Co.; G. S. Hawley, The Bridgeport Gas Light Co.; R. L. Fletcher, Providence Gas Co.; F. L. Ball, New England Power Service Co., Boston; R. H. Knowlton, The Hartford Gas Co.

Division Chairmen: *Accounting*: M. J. Coughlin, The Hartford Gas Co.; *Industrial*: R. D. Hawkins, The Bridgeport Gas Light Co.; *Manufacturers*: G. D. Yeaton, Detroit Michigan Stove Co., Boston; *Operating*: W. C. Slade, New England Power Service Co., Boston; *Sales*: R. D. Stuart, Jr., Fall River Gas Works Co.

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Major Alexander Forward, managing director of the American Gas Association, warned of a little piracy that the A.G.A. is contemplating, — speaking of President Rutherford, he said "he is recognized as a coming man . . . you saw him first but he is already bespoken to head up the domestic sales activities of the A.G.A. next year."

The Major also discussed the national advertising campaign.

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Awards for the most valuable papers contributed during the year were made to nine member company employes for papers presented before their respective divisions. Accounting theory and practice must be highly regarded at Connecticut Light & Power, since two representatives of that company, L. A. Mayo and M. F. Young, won both Accounting Division prizes.

• • •

Clark Belden's report as executive secretary was a masterpiece of understatement. Research in the field of operating problems; round table discussions that have increased in number and significance; employe educational activity; increasing cooperation from member companies; the addition of a substantial number of new members.

WEDGEWOOD
THE MODERN RANGE FOR MODERN NEEDS

BUNNY'S WAFFLE SHOP & RESTAURANT • SAN FRANCISCO

One of the newest and most modern chains of San Francisco restaurants, whose specialty is *Service* and *Quality Foods*, depends upon WEDGEWOOD *Custom Built* GAS RANGES for maintaining efficient and economical operation.

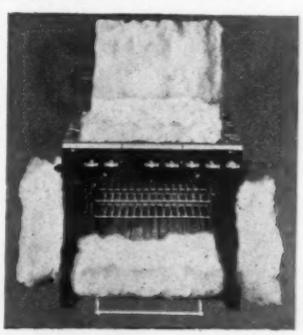
26 Range-Top Combinations
•
Efficient Economical Operation
•
20% More Cooking Area
•
Flexible Cooking Capacity
•
Uniform Heat Distribution
•
Rugged Streamline Style
•
WEDGEWOOD RANGES ARE FACTORY BUILT FOR ALL TYPES OF GAS

DOUBLE OVEN MODEL

This splendid, serviceable WEDGEWOOD has two fully insulated ovens with two oven thermostats. Cooking Top is equipped with smoothly polished double griddle, two hot top sections and four open top burners. All Wedgewood heavy duty ranges are finished in lustrous and durable chromium to permit greater ease in cleaning.

EXTRA THICK INSULATION TOP, BOTTOM, SIDES AND DOOR

Extra-heavy insulation keeps the heat in—keeps the kitchen cooler and saves almost enough on the gas bill to pay for the range.



WEDGEWOOD *Custom Built* **HEAVY DUTY GAS RANGES**

JAMES GRAHAM MANUFACTURING CO. • Los Angeles, San Francisco, Newark, California • Portland, Oregon

during the year, and many other important projects and activities were dismissed with a sentence each.

• • •

"As the Community Develops," — as it grows and prospers, so does the gas company, — was the theme of a paper on utilities cooperating with local civic groups and chambers of commerce by H. C. Thuerk, New York.

• • •

John A. Fry's paper, the "Significance of the A.G.A.E.M.," was devoted to the common problem of utilities and appliance manufacturers . . . "Gas can only be consumed through an appliance . . . the whole great investment in gas utilities is no safer than the quality of gas appliances in use in the American home . . . whenever the quality of gas is improved we give better service through our appliances . . . when rates are made more attractive we sell more appliances and add to the gas load."

• • •

Walter C. Beckjord, president of the American Gas Association, sees the "Gas Industry at the Crossroads." "The fundamental problem of selling our industry to our customers and to the public at large is still with us . . . there has been too much complacency . . . We have made excellent progress in public relations but we still have many things to learn . . . moving pictures, automobiles, radio have shown us methods of salesmanship that make us look like the hare and the tortoise combination . . . the outstanding accomplishments of the last few years have been fostered in the activities of the A.G.A. . . . There are over 115,000 CP ranges in service now . . . that many more will be sold this year . . . House heating . . . formerly scoffed at is an accepted fact in new home design. Much constructive work has been done in air conditioning . . . much remains to be done to increase the efficiency and reduce the installation costs for domestic installations . . . We must do more clear headed thinking and not so much wishful hoping about our problems . . ."

• • •

Fred Van Covern of the American Petroleum Institute sees little to fear from the threat of our petroleum supply being exhausted. "Recent consideration of the subject indicates that about one half of the known reserves of crude oil in the entire world are located in the United States, where the industry is producing more than a billion and a quarter barrels per year."

• • •

The advantages of modern cost accounting procedure were summarized by Wm. F. R. Munnich of Philadelphia in the conclusion of his paper "Cost Accounting — More Than History." "Once a procedure is set up the increased expense of cost accounting is negligible."

• • •

An interesting innovation was the panel discussion which concluded the Thursday afternoon business session. R. L. Fletcher of Providence acted as chairman and put his associates through their paces in the most approved radio forum technique. Asked to summarize their credos in a few words most of the participants were hard put to be as brief as Chairman Fletcher sternly insisted. Messers. Barnum, Bertolette, Johnson, Reynolds, Rutherford and Twohey opined however that hard work; more sales promotion effort; lower distribution costs; lower costs of gas in the holder; more and a greater number of rate classifications all constitute factors that have a bearing on industry problems.

• • •

The one act play "Because of These Things," which panicked the A.G.A. last fall was repeated by the Owens Players of the Brooklyn Union Gas Co., as a special feature following the business session on Thursday afternoon. As a resume of the mistakes of management in the past, the piece packed a message that wasn't lost on the audience.

• • •

Friday morning might well have been characterized as a load-building symposium. D. H. Linton started off by analyzing the load that has disappeared, due to changing family habits, inroads of competition, and other factors.

The problem of recovering what has been lost, and adding to what has been retained, was then taken up by an imposing list of speakers who presented the case for various appliance sales activities. J. J. Quinn discussed ranges, with the CP campaign getting the major attention. "The Case for Water Heaters," as analyzed by J. J. Quinn, revolves around automatic water heating more than any single factor. "The Case for Refrigerators," as presented by Arnot D. Hirst, showed that the refrigerator load has about everything that is desirable. Over twenty million dollars gross revenue during 1939 the speaker attributed to gas refrigeration. C. George Segeler of the A.G.A., in presenting "The Case for the Commercial and Industrial Fields," complimented the New England operators on the fact that they have already established an enviable record in these fields . . . they are getting this revenue at more profitable levels than the national average."

"Kitchen Heating" has a case of its own, and this was amply presented by B. J. Bean of Worcester. Said Mr. Bean, commenting on competition:

> "A rat and a robin, a cat and a mouse,
> All went to live in the same little house.
> But only one of the four got fat;
> And it wasn't the robin, the mouse or the rat."

• • •

"House Heating" is able to stand on its own feet, providing it is given a low enough rate to successfully compete with other fuels, in the opinion of R. D. Stuart, Jr., of Fall River. And an important by-product is the water heating, cooking and refrigeration load that follows in its wake.

C. F. Cushing presented "The Case for Air Conditioning," and summarized in conclusion, "The gas industry must sponsor an intensive educational campaign on gas-using summer air conditioning equipment."

• • •

Association research in servicing questions is a more or less continuing activity with the N.E.G.A. and a report on work in progress in four fields was reported by the committee chairmen: H. L. Dalbeck, Accounting Service; J. L. Johnson, Contact and Job Training; E. H. Eacker, Equipment Design and Standardization, and E. R. Hamilton, Gas Conditioning.

• • •

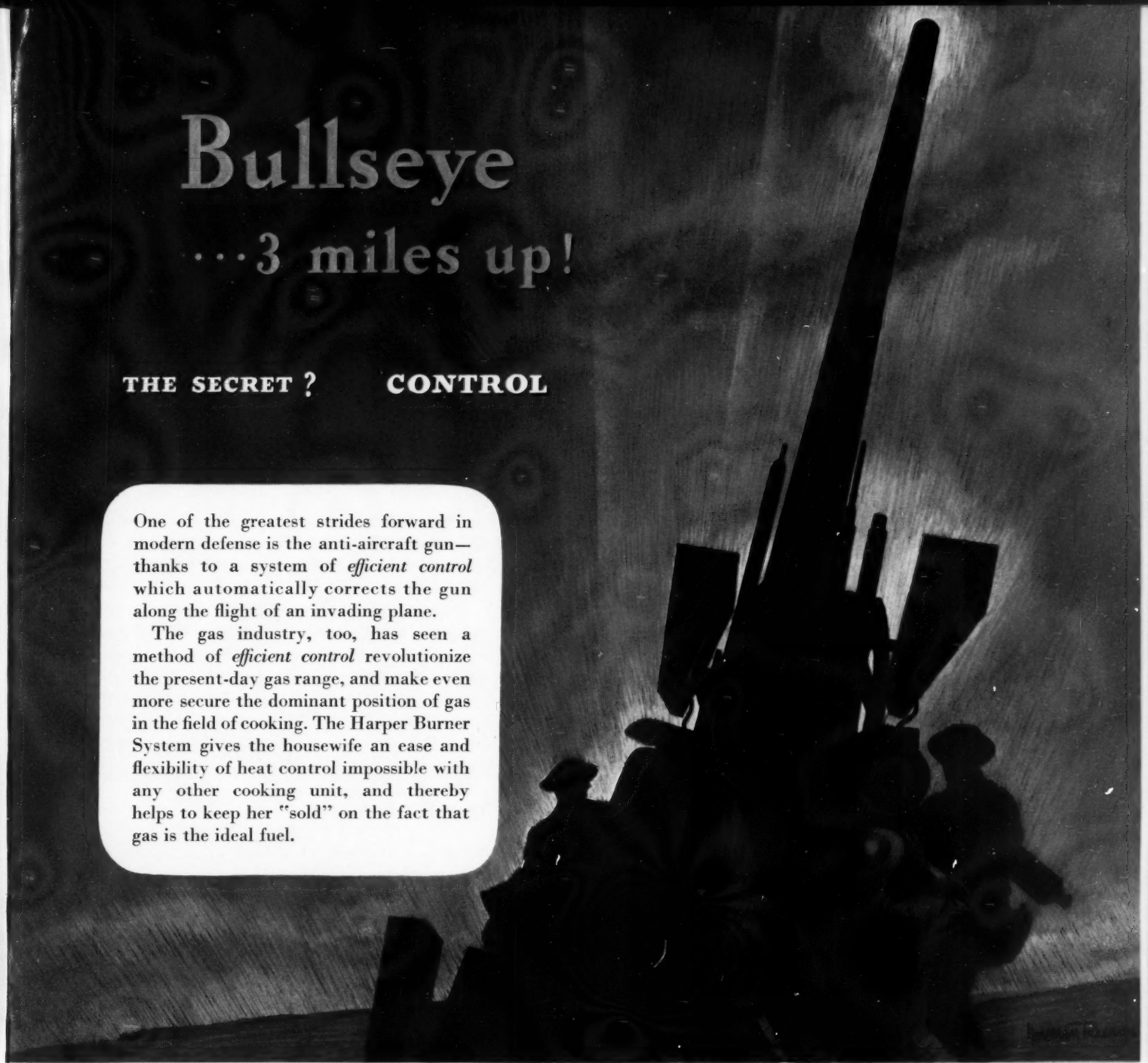
The Home Service luncheon held Friday noon was attended by sales managers and member company executives in addition to the ladies who traditionally give the most thought to the practical aspects of home service problems. John A. Weiser, John F. Tullie, Eleanor G. Kingsley, Lydia E. Flanders and Eliza M. Stephenson were all on the program for brief talks on various aspects of this important customer relations department.

• • •

The consumer movement came in for a competent analysis in a Friday afternoon paper delivered by James L. Fri of Columbia University. "The consumer movement is consumer opinion translated into some form of agitation or action. . . . Insofar as the movement is motivated by the . . . desire to make business more honest . . . it is of great benefit not only to the consumer but to business itself."

• • •

"Gas Company Progress," by Hall M. Henry, was in every sense a masterly survey of the industry as it stands at the beginning of 1940. Devoting particular attention to the figures representing progress in New England, Mr. Henry concludes that the territory has need for an Association Sales Research Program.



Bullseye ...3 miles up!

THE SECRET ? CONTROL

One of the greatest strides forward in modern defense is the anti-aircraft gun—thanks to a system of *efficient control* which automatically corrects the gun along the flight of an invading plane.

The gas industry, too, has seen a method of *efficient control* revolutionize the present-day gas range, and make even more secure the dominant position of gas in the field of cooking. The Harper Burner System gives the housewife an ease and flexibility of heat control impossible with any other cooking unit, and thereby helps to keep her "sold" on the fact that gas is the ideal fuel.

CONTROL *is the secret here, too*

● The Harper Burner System is a patented invention whereby each of the burners on the range is actually 2 burners in 1 . . . a burner within a burner . . . both operated and controlled by a single handle.

This arrangement affords a high-speed STARTING BURNER to *start* foods boiling and for fast frying . . . plus a small, central, economical COOKING BURNER for *maintaining* the cooking. The COOKING BURNER can be used entirely independently of the STARTING BURNER. No other top burner possesses this vital advantage — which insures easy, accurate control: just the right heat for every type of top-burner cooking . . . every time.

HARPER-WYMAN COMPANY
8562 Vincennes Avenue, Chicago, Ill.

HARPER BURNER SYSTEM

HARPER BURNER SYSTEM

Demonstrates GAS at its best

SEE OTHER SIDE OF THIS PAGE

FACT:

A perfect "Keep Warm" heat *becomes a reality with the Harper Burner System*

REASON:

The Harper COOKING BURNER, when turned low, will keep the contents of a covered vessel at about 150 degrees . . . the ideal temperature for serving. This welcome service cannot be duplicated by any type of so-called "simmer" or Hi-Lo burner. They cannot offer the exact control of heat that is provided by the Harper COOKING BURNER which, operating independently of the complete STARTING BURNER, provides any shade of heat desired, beginning with the merest warming flame. No other burner permits such responsiveness, especially in the range of low heats.

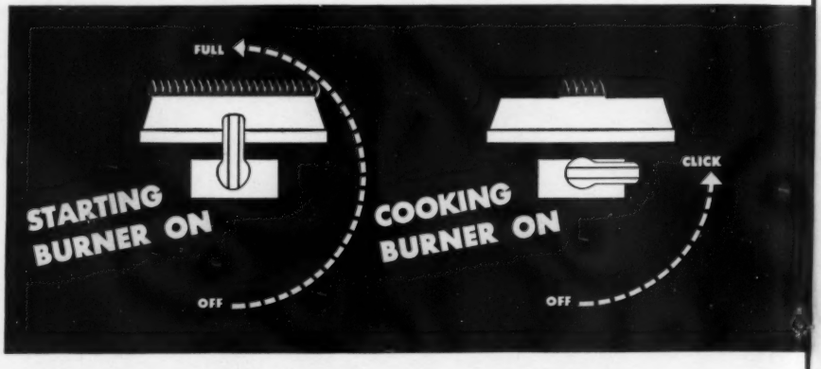
BENEFITS:

The *order* of cooking in preparing a meal is no longer a problem on a gas range equipped with the Harper Burner System. All foods can be started at the same time. As each dish is cooked, the COOKING BURNER is simply turned down to "Keep Warm" heat, and the food will stay at the proper serving temperature . . . without danger of its *continuing* to cook.

Time is saved, trouble is avoided—no more tasteless, soggy food due to over-cooking.

• • •

A simple, non-technical demonstration serves to convince the customer or prospect that the Harper Burner System offers a new and better way to cook . . . convinces the gas industry that here truly is "The best way to demonstrate GAS at its best".



The Harper Burner System provides a burner within a burner. The diagram above shows how the COOKING BURNER operates entirely independently of the STARTING BURNER. Yet both are controlled by the same handle.

We shall be glad to send you, without cost, two booklets that tell the complete Harper Burner System story . . . "Modern Methods of Top Burner Cooking" and "The Greatest Cooking Discovery in 40 Years". They should be valuable to anyone interested in the promotion of gas cooking and gas appliances. *Harper-Wyman Company, 8562 Vincennes Avenue, Chicago, Ill.*

HARPER BURNER SYSTEM

HARPER · BURNER SYSTEM ·

SEE OTHER SIDE OF THIS PAGE

Missouri Utilities Announce Program for April Meeting

THE annual state convention of the Missouri Association of Public Utilities will be held this year at the Elms Hotel, Excelsior Springs, Mo., April 17, 18 and 19. The membership of the Association includes virtually all of the privately-owned gas, electric, and water companies in Missouri.

Among the speakers will be: Col. Willard Chevalier, New York City, publisher of *Business Week;* Elmer F. Schmidt, chairman, Natural Gas Section, A.G.A., Dallas, Texas; W. J. Amoss, New Orleans Public Service, Inc., New Orleans, La.; R. M. Winsborough, Middle West Service Co., Chicago, Ill.; George M. Burns, director, Kansas City (Mo.) Safety Council; O. H. Day, director, Vocational Education in the Kansas City (Mo.) Public Schools. President E. H. Lewis, Webster Groves, Mo., will preside.

A state-wide speaking contest for employes of gas and electric companies in Missouri for cash prizes will be held on the evening of April 17. Eight companies will have contestants. The subjects will be: for women, "Utility Service, the Labor Saver"; for men, "Let's Know Our Business."

W. B. Head, Jr., Missouri Public Service Corp., Warrensburg, Mo., will act as chairman at an open forum on Thursday afternoon for the discussion of timely utility problems. A safety meeting on Wednesday afternoon under the auspices of the Accident Prevention Committee will include a one-act playlet, "A Court of Accident Investigation."

■ ■

Lone Star Gas Co. Plans New 45-Mile Gas Line

The Lone Star Gas Co., Dallas, Texas, will lay an 8-in. welded line from Page field to San Angelo, for the movement of gas in the fulfillment of the Cooper Gas Co.'s contract to supply the fuel requirements of the West Texas Utilities Co., at Dumas, Texas. The Cooper Gas Co. recently purchased holdings in the Page field from the Lone Star Gas Co. and the Lone Star Gasoline Co., at which time the companies signed a contract for the new line, it is reported by John M. Cooper, chairman of the board of the Cooper Gas Co. The contract declares the line will have to be completed by January 6, 1941. The new line, which will cost approximately $300,000, is expected to carry around five million cu. ft. of gas daily.

■ ■

Kentucky Natural Co. May Distribute Indiana Gas

Owners of natural gas wells in Spencer County, Ind., east of Rockport, are negotiating with the Kentucky Natural Gas Corp., Owensboro, Ky., for the sale of natural gas to be distributed to consumers in the southern states. According to Gordon F. Fix, assistant state geologist, 15 wells were developed in Spencer county last year and are producing a total of 75,000,000 cu. ft. of gas per day.

■ ■

Penn State Draws Students

The Petroleum and Natural Gas Division of Penn State University, State College, Pa., during the 10 years of its existence, has become the second largest unit in the school, with an average undergraduate and graduate enrollment of about 70 students during recent years. The department was established in 1929 by a special research grant of $50,000 from the state.

Not a movie set but what was once a Shreveport (La.) residence before a tornado hit that city last March 12. Aftermath: the Arkansas-Louisiana Gas Co. shut off 125 services, removed for repair 123 meters. Two meters were never found.

Gas Service Again Meets an Emergency as Tornado Sweeps Through Shreveport

WHAT was first thought to be a gale, but was later termed a tornado, struck Shreveport, La., between 4:30 and 5 p. m., March 12, according to Paul E. Clay, advertising and news department, Arkansas-Louisiana Gas Co., Shreveport. The storm entered the state near Elysian Field, Texas, and headed toward the Greenwood area, where it struck and apparently lifted until it came to Flournoy, La. It then followed a route north of the Flournoy road in a northeastwardly direction, damaging most of the buildings and structures along the road. In the Country Club area it apparently widened its path and turned, following an eastwardly direction through the city.

The tornado seemed to rise and fall or just bounce through the city, hitting one section and entirely missing others. Then at times it seemed to reverse itself, traveling back over its own path for short distances, as though to make sure nothing was left standing.

Midnight darkness accompanied the storm. So dark were the downtown streets that street lights were turned on. Hail, rain and a violent electrical storm followed the tornado.

Eleven persons were killed and 60 injured. Between 2000 and 2500 Shreveport families were affected by the tornado—that is, their homes were partially damaged or completely destroyed. The Fire Companies Adjustment Bureau, Inc., estimated the total storm loss in Shreveport to be between $2,000,000 and $2,500,000.

Neither the weather bureau nor the airports had an anemometer in the direct path of the storm, but wind velocity of 62 miles per hour, with gusts occasionally sweeping through at 75 miles per hour, was recorded at Barksdale Field.

As a result of the tornado, the gas distribution department of Arkansas-Louisiana Gas Co. made a house-to-house survey in the affected areas, starting immediately after the storm. It was necessary to cut and plug at the curb 125 services, and remove 123 meters and bring them to the shop for repair. Two meters were never found. There were six meter or regulator houses of the distribution department damaged and nine of the pipe line department. Some were damaged only a little and others completely demolished.

■ ■

Texas Production Increases

Natural gas production in Texas in December, 1939, was the largest volume ever recorded, being 4.2% larger than November and 22.6% larger than December, 1938, according to a report of the Railroad Commission of Texas, Lon A. Smith, chairman. The pipe line market also continued to show increased demand during December, the gain for the state being 3.5%.

■ ■

Credit Union Pays Dividend

The East Ohio Gas Co.'s (Cleveland) federal credit union held its annual meeting in February and voted a 6% dividend. New officers for the year were also elected at the meeting, naming John J. Schaeffer and Charles E. Smith as directors.

SALES Slants

VITALIZE YOUR SALES

HOW can you insure healthy sales? Well, how do you insure a healthy body? By eating right! The body requires *vitamins* to function properly. If you want to stay healthy, you must watch your diet. Why not try the same thing with your sales? Try feeding them the proper *vitalizers* and see if they, too, won't stay healthy and vigorous.

A Saleshealthy Smile

THERE is Vitalizer A, for instance; that is the ingredient found in an agreeable smile. It gives you a bright outlook on life, breaks down the chill

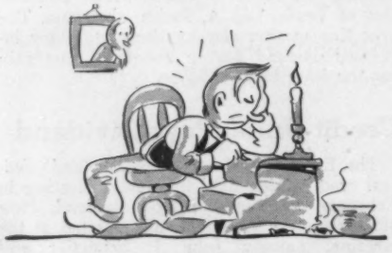
Smile and make your prospect happy.

of sales resistance, and is essential to sales health. A sour puss will kill off a sale in no time at all.

This is a vitalizer you can't store; you have to have fresh supplies of it every day, rain or shine. The sun may not be out, last night's dinner may not have agreed with you, but if you smile you'll be amazed how it will change the aspect of things, and bring orders flocking to your salesbook.

Knowledge Is Power

THEN there is Vitalizer B, the weight building vitalizer. This is secured by keeping posted on what's doing in your business. A little of it can be obtained by reading the literature that is prepared for you. But real sales weight may be added only by *studying* that literature, making it part of your sales story.



The midnight oil lubricates sales.

Salesmen who are real heavyweights in their field are the ones who think about their job 24 hours a day. There is lots of Vitalizer B in good old fashioned midnight oil. Instead of just riffling through the books and pamphlets which have been prepared for your information and guidance with so much thought, try a little home work with them.

Keep Prospecting for Prospects

THE "C" in the next vitalizer stands for *contacts*. Without contacts, your sales slough off, get weak and uncertain. Even though you may have plenty of Vitalizer A and B, without contacts you can't keep up your sales. Check up on your old contacts every day, and make plenty of new ones.

Friends acquired mean sales transpired.

There is the old story of the colored man fishing in the wash tub in his backyard. When someone pointed out he couldn't hope to catch any fish there, he replied: "Yassuh, Ah knows dat, but it's so convenient." It may be very convenient for you to fish for prospects in the same backyard every day, but you can't expect to catch any sales.

Tales Make Sales

VITALIZER D is the dramatic vitalizer that stimulates sales imagination. It is the vitalizer that pulls your presentation out of the rut of the commonplace and the stereotyped, and makes it new and arresting. It is the vitalizer that gave an accident insurance salesman the imagination to show his prospect an itemized hospital bill of an accident case. It is the vitalizer that gives every successful salesman the imaginative power to make his sales story dramatic and alive. Take lots of Vitalizer D for healthy sales.

The play's the thing that makes the cash register ring.

Ask Early and Often

AND then comes Vitalizer E, the "eventually-why-not-now" vitalizer that goes straight to the spine and gives the salesman the necessary backbone to ask his prospect to buy. No matter how convincingly you demonstrate the merits of your merchandise, people are not going to buy unless you come right out and ask them to. If you are afraid to ask them, then your sales need a generous treatment of Vitalizer E to give you the backbone to ask for a commitment early and often.

Vitalizer E helps a salesman to remember that he is selling merchandise. So many times in his enthusiasm for his proposition, a salesman will forget that everything he is doing and saying is merely a build-up to the dotted line. Having exhausted the time and patience of the prospect telling him or her all about it, he will find himself nowhere nearer the sale than when he started. "Ask them to buy" is the admonition that should be written over every salesroom door.

Faint heart never won fair sale.

The Winnah!

★ NEW PACIFIC FLOOR FURNACES ARE REVELATIONS IN EFFICIENCY

Every basic feature brand new — developed and proved in the laboratory of experience — truly a marvel of engineering and manufacturing skill. Pacific Floor Furnaces are taking the trade by storm, gaining popularity and acceptance everywhere shown.

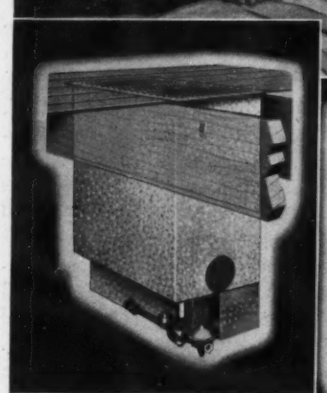
A.G.A. APPROVED according to latest Testing Laboratory requirements. Models and sizes for all practical needs. Design simplified for easy installation. Service problems *nil*. Glowing praise from home owners—for their efficiency, economy, low initial cost and SUPERB HEATING COMFORT !

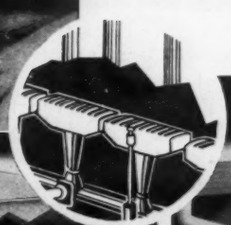
FULL LINE 10 STANDARD CONTROLS

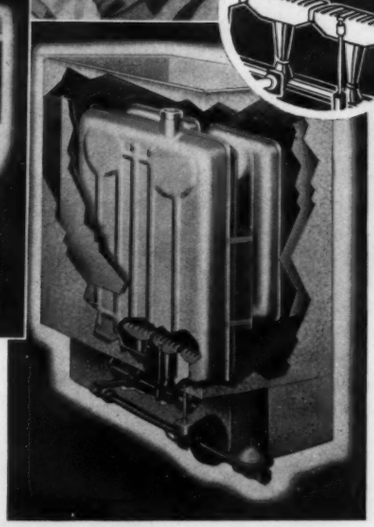
More than ever "the leader", PACIFIC offers 1940 features not found on any other floor furnace. Write for complete details — *you'll be surprised !*

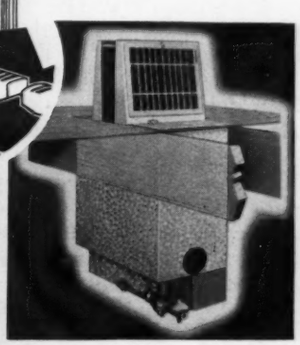
A REAL CHAMPION Every Feature a "KNOCK-OUT"

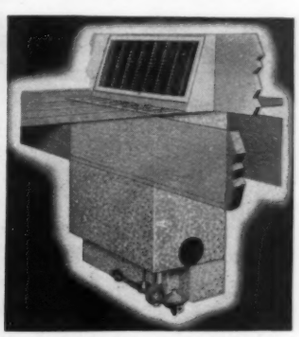
1. *Absolutely Silent Operation* —die-formed and embossed element eliminates expansion and contraction noises.
2. *Close-Mesh Fabricated Grille* — no more unsightly "open" registers to act as "catch-alls" for the children's playthings.
3. *Lower Grille Temperatures* —no more register "hot spots" during high heat operation.
4. *25% More Heat Flow* — streamlined air passages, more air through furnace and faster radiation — cut fuel bills!
5. *Air-Insulated Wall Registers* —inner and outer register boxes provide insulating air space for maximum safety and efficiency.
6. *Simplified Manual Control* —progressive "one way" pilot and main burner valve replaces old "two valve" method.
7. *Interchangeable Controls* — manual control can be replaced at any time with standard package thermostat control assembly — changed in 3 minutes!











Pacific makes a complete line of gas heating appliances — space heaters, water heaters, floor furnaces, basement furnaces, winter-summer air conditioners.

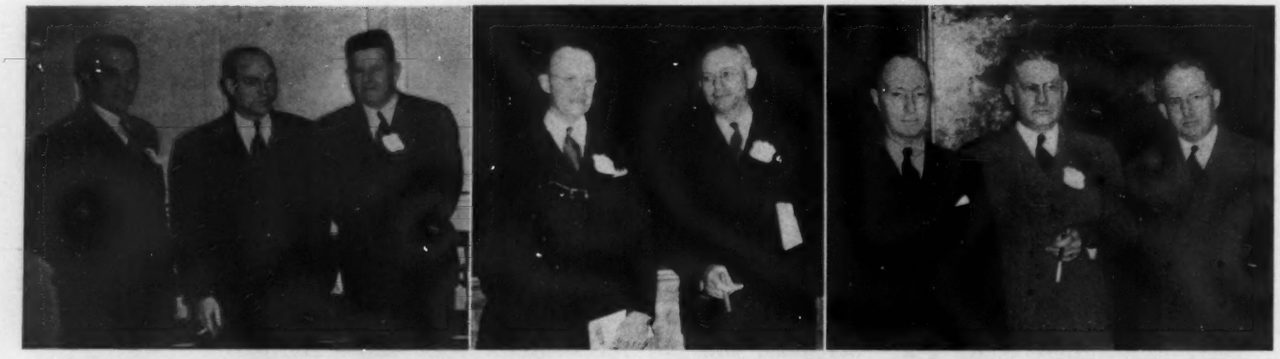
Keep Posted on Pacific Products and Prices

PACIFIC GAS RADIATOR CO.
(Dept. G4)
Main Office and Factory: Huntington Park, Calif.

Pacific

26 SUCCESSFUL YEARS

AND STILL GROWING



AT THE OKLAHOMA meeting. LEFT: F. H. Mugg (Lawton, Okla.) and E. J. Joullian (Oklahoma City) of Consolidated Gas Utilities Corp. surround H. A. Kahler, Sprague Meter Co., Oklahoma City. CENTER: W. H. Carson, dean, College of Engineering, University of Oklahoma at Norman, and Elmer Schmidt, Lone Star Gas Co., Dallas. RIGHT: B. C. Adams, Gas Service Co., Kansas City; J. Y. Wheeler, Community Natural Gas Co., Denison, Texas; C. A. Breitung, Southwest Natural Gas Co., Ada, Okla.

Oklahoma Utilities Hold Annual Sessions

GAS companies, through depression years, demonstrated their ability to survive and grow in the face of an 11-billion-dollar reduction in gross revenue and a four-billion-dollar increase in taxes. This was pointed out by Elmer Schmidt, Dallas, Texas, chairman, Natural Gas Section, A.G.A., speaking before the 22nd annual convention, Oklahoma Utilities Association, at the Biltmore Hotel, Oklahoma City, Okla., held March 18 and 19.

"There is nothing economically wrong with the gas companies," he asserted. "During the past three years they have taken advantage of lower interest rates, through 175 million dollars of new financing. They have demonstrated also their soundness by delivering gas, during depression years, to several large cities, some more than 1100 miles beyond the sources of gas supply," Mr. Schmidt said.

"You must not forget that you do not have a monopoly," Frank B. Long, vice president, Oklahoma Natural Gas Co., Tulsa, and president, Oklahoma Utilities Association, cautioned the gas and electric utility delegates. "You still have coal, wood, oil and candles in Oklahoma." He cited figures showing the great investments and services of gas and electric utilities in Oklahoma, and added that care must be taken by management of these industries unless some "land on their heads," since they are encountering more difficult problems than ever before.

Some apprehension for the rate-making future of gas companies was expressed by Robert D. Garver, counsel, The Gas Service Co., Kansas City. Many established principles of valuation, practiced by state regulatory bodies and recognized by the courts, were changed by the Interstate Commerce Commission in making a valuation of interstate oil pipe lines owned by a company affiliated with The Gas Service Co., Mr. Garver asserted. If applied by the federal power commission to valuations of gas pipe lines, these changed principles might seriously affect the future of some gas companies.

The wife of a utility district manager can exercise a helpful or damaging influence on public opinion of the utility, said P. V. Root, himself district manager for the Oklahoma Natural Gas Co., at Muskogee. "Gossip is a pitfall this wife should avoid. 'Be democratic' should be her slogan because she deals with the same general public as her husband," he advised.

Rapid growth of the Southwestern Gas Measurement Shortcourse was cited by W. H. Carson, dean, college of engineering, University of Oklahoma, Norman, which sponsors the course.

During brief division meetings, gas and electric division chairmen were chosen. The gas division selected A. F. Potter, general manager, Bartlesville Gas Co., Bartlesville, Okla., as chairman to succeed W. L. Woodward, president, Zenith Gas System, Inc., Alva, Okla. The new electric division chairman is J. C. Happenny, president, Oklahoma Power and Water Co., Sand Springs, Okla., succeeding R. K. Lane, president, Public Service Co. of Oklahoma, who recently was elevated to the presidency of the association. Each division plans fall meetings.

Non-utility speakers included E. W. Smartt, chairman, state board of public affairs, Oklahoma City, and Dave Vandivier, president, Oklahoma Press Association, Chickasha, who presented "The Newspaper Viewpoint."

R. K. Lane, association vice president, was toastmaster at the annual banquet Monday night. Dr. Howard Taylor, Chickasha, was the speaker. The banquet was followed by a dance.

President Frank B. Long

Secretary Kate A. Niblack

Preview of coming campaigns by

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

GAS APPLIANCE SOCIETY OF NORTHERN CALIFORNIA

AUTOMATIC GAS WATER HEATER CAMPAIGN

The worthy objective of this campaign is to replace non-automatic water heaters with up-to-the-minute, gas-fired automatics, and to that end the industry is making a special allowance of $12.00 on old equipment. This is the inducement which proved so successful in last year's campaign, and bears the approval of all branches of the industry.

There will be much advertising, all contributed by the Pacific Gas and Electric Company to help YOU sell automatic gas water heaters. This alone will cost the company $32,500.00. In addition, the company is sharing in the $12.00 trade-in allowance and, furthermore, is sharing in the cost of dealer advertising.

Watch carefully for a more complete announcement of the campaign wherein we will give the official rules. When you receive it, start immediately to plan what you will do to make this campaign PAY YOU!

Starts May 1

G 204-116

DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Gas Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Gas Appliance Society, 1355 Market Street, San Francisco, California.

INDUSTRY *Personalities*

Thomas P. Kelly, who has for a number of years been working out of the Chicago office of Standard Gas Equipment Corp., has recently moved to Boston as assistant to **Harry King,** New England manager of the same company. During his three years in Chicago, Mr. Kelly specialized in hotel and restaurant installations.

Harry King's many friends in the trade will be glad to know that he has the doctor's assurance that the long siege of inactivity following his automobile accident in January is nearly over, and that he expects to be on hand for the New England Hotel Show in the latter part of this month.

V. G. East, stationed at Santa Fe, N. M., for the past six years by the Southern Union Gas Co., Dallas, Texas, has been transferred to Belen, N. M., in the capacity of manager. **Jessie Adkins,** of Belen, has been employed as cashier.

Charles E. Wilson, vice president since 1934, in charge of the Pacific Coast operations of the Worthington Pump and Machinery Corp., is moving his headquarters to the home office of the corporation at Harrison, N. J., where he will direct the sales of all products handled by the corporation's Carbondale Division, which specializes in air conditioning and refrigeration equipment. Mr. Wilson succeeds **H. A. Feldbush,** who will devote his time to the manufacturing department of the corporation. Mr. Wilson is also assuming directional charge of the sales of all the corporation's products built at the Holyoke, Mass., factory.

Howard B. Churchill, formerly assistant comptroller of New York Power and Light Corp., Albany, N. Y., has been elected assistant comptroller of the Niagara Hudson Power Corp., New York, N. Y.

Howard D. Megahan, assistant treasurer of the Philadelphia Co., has been elected treasurer of that company and subsidiary companies of Pittsburgh, it has been announced recently by Frank R. Phillips, president. Mr. Megahan succeeds C. J. Braun, Jr., who died recently.

Col. W. B. Tuttle, chairman of the board of the San Antonio Public Service Co., San Antonio, Texas, was honored recently at a banquet for his service in the development and welfare of San Antonio.

Appointment of **Clayton L. Nairne** as general superintendent of the Gas Department of the New Orleans Public Service Inc., to succeed the late Arthur E. Merchant, was made recently by the officials of that utility. Mr. Merchant died suddenly from a heart attack in December of last year. Mr. Nairne was formerly superintendent of distribution of the department.

C. L. NAIRNE

Mr. Nairne, a native of New Orleans, La., received his degree in Engineering from Tulane University in June, 1924.

He entered the employ of the New Orleans utility as as student engineer in July of 1924. He left this company for a while to accept the position as plant betterment engineer in the Power Department of the Florida Power and Light Co. in February, 1926. In 1928, however, he rejoined the New Orleans company as Combustion Engineer in the Gas Department. He also served, prior to his present position, as assistant chief engineer and superintendent of the Meter and Appliance Division in the Gas Department.

Roy E. McGuire, of Sapulpa, Okla., has been named manager of the Baxter Springs, Kan., office of the Baxter Springs Gas Co. He had been with the Sapulpa Gas Co. for 14 years, and takes the place of **W. J. Jackson,** resigned.

W. S. Arthur has been appointed to manage sales engineering for the newly established St. Louis office of the Cooper-Bessemer Corp., Mt. Vernon, Ohio. Mr. Arthur has had many years of experience in the machinery field, having entered the industry in 1916. In 1927 he was president of the Ohio Pump & Supply Co., but resigned in 1931 to join with the Superior Engine Co., where he was made head of their Chicago offices in 1936.

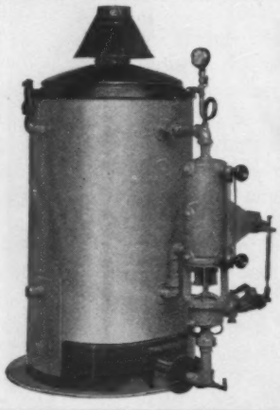
J. W. Reed, Pacific Coast manager of the Cooper-Bessemer Corp., has been transferred recently from Los Angeles to New York, where he will become manager of the Gas Division. He began his new duties in New York April 1. John Rogers, formerly with Ingersoll-Rand, will replace Mr. Reed as Pacific Coast manager of Cooper-Bessemer, with headquarters in Los Angeles.

J. W. REED

Mr. Reed joined the company in 1924, and in 1929 was made Pacific Coast manager.

Carroll Miller, a member of the Interstate Commerce Commission and associated with the American Gas Association, has received a seven-year reappointment to the Commission from President Roosevelt. Mr. Miller was first appointed to the ICC in 1933.

W. A. Brookshire has been appointed chief clerk of the local United Gas Corp., Nacogdoches, Texas. The announcement was made by R. M. Nicol, district manager. Mr. Brookshire has been with the company for several years. **Sid Jackman,** who formerly held the position as chief clerk, has been transferred to the general office at Houston.



INDUSTRIAL GAS BOILERS

Plain tubular . . . . . ¾ to 10 H.P.
Water Leg tubular . . 5 to 45 H.P.
HE Flueless . . . . . 1 to 18 H.P.

ASME Code for 100 lbs. S.W.P., also for higher pressures.
Non-electric Low Water Cut-offs for all types of boilers.

P. M. Lattner Mfg. Company
CEDAR RAPIDS IOWA

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The only publication devoted to the Liquefied Petroleum Gas Industry.
Enter my subscription to start at once

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Name.....Position.....
Company.....
Address.....
City.....State.....
☐ Check enclosed ☐ Send bill

Oliver R. Evans, since 1930 division superintendent of the Pacific Gas & Electric Co. at Stockton, has been transferred to the San Francisco headquarters, as assistant general superintendent of the company's San Francisco and East Bay divisions.

O. R. EVANS

Mr. Evans was succeeded by **George A. Peers,** who was promoted from the Coast Valleys division at Salinas to the post of superintendent at Stockton.

Mr. Evans joined the P. G. & E. Co. as a member of a line crew in Santa Rosa. During the World War he served first as a private in the 37th Regiment of Engineers, advancing to the rank of First Lieutenant before he was mustered out in 1919.

Upon his return to California, he rejoined the P. G. & E. in the valuation department, and within a few months was transferred to Stockton as a line foreman. In turn, he was promoted to be general foreman, then district superintendent at Santa Rosa, and in 1930 was returned to Stockton as division superintendent.

Mr. Peers, the new Stockton division superintendent, has held the same title in the Coast Valleys division, with headquarters at Salinas, since 1930. For 10 years prior to that time he had been assistant superintendent, employed first by the Coast Valleys Gas & Electric Co., predecessor of the P. G. & E., in the Salinas region.

Mr. Peers is a graduate of Stanford University, class of 1915, and first joined the company as an apprentice electrician during vacation time in 1913.

Edward F. Leary has been elected to membership on the Metropolitan Utilities Board, of Omaha, Neb., succeeding **Frank J. Burkley**, who has been a member since 1923, but who recently resigned.

Frances Cowing and **Betty Stuart Smith,** both of Chicago, have been appointed to the home economics department of Servel, Inc., in New York City. The two home economists will assist Jane Tiffany Wagner, director of home economics activities.

Edward Meyer, residential salesman for Portland Gas & Coke Co., Portland, Ore., was recently awarded the commercial manager's medal for 1939, donated by John J. Winn, Jr., to the member of the commercial department who makes the biggest improvement over the previous year, it was announced by R. G. Barnett, vice-president and general manager of the company. Mr. Meyer's gas range sales in 1939 showed a 148% increase over 1938, gas refrigerator sales increased 125%, furnaces and conversion burner sales scored a 50% increase and gas water heaters increased 34%.

EDWARD MEYER

David W. Robinson, Jr., has resigned as General Counsel of the Federal Power Commission and **William S. Youngman** of Massachusetts has been appointed as his successor. Mr. Youngman's appointment became effective April 1. Mr. Robinson, who

Another WIN for BITUMASTIC

REG. U.S. PAT. OFF.

Bitumastic 70 B Enamel used to protect the entire 243 miles of 16 inch pipe laid for Northern Natural Gas Company

It was only natural that after having proved its worth on many successive jobs for the Northern Natural Gas Company, Bitumastic 70 B Enamel should be selected for this 243 mile stretch of 16 inch pipe between Sioux City, Iowa and Minneapolis—the longest natural gas trunk line laid in many years. Another tribute to the unmatched record of Bitumastic in protecting oil and gas pipe lines against corrosion.

On this job, the pipe was machine coated with Bitumastic 70 B Enamel, applied simultaneously with 80 pound Kraft paper bonded to the enamel, and an unbonded wrapping of asbestos pipe line felt.

Bitumastic 70 B Enamel provides many advantages over ordinary coal tar coatings: better flexibility, better adhesion, greater resistance to expansion and contraction, exceptional resistance to soil stresses, greater ability to withstand handling abuse.

No other pipe coating material has been in use as long as Bitumastic; no other equals its performance record.

Also manufacturers of Industrial Paints for Exterior and Interior Plant Surfaces

WAILES DOVE-HERMISTON CORPORATION
New York - Philadelphia - Cleveland - Chicago - Houston - Tulsa - San Francisco - Los Angeles
WESTFIELD, N. J.

WILLIAMS BROTHERS CORP.
PIPE LINE
CONTRACTORS
OIL - GAS - GASOLINE - WATER
Also Heavy Construction
CHICAGO • TULSA • HOUSTON

MORE NET PER M

The
REPUBLIC LO-BILL
CONVERSION
WATER HEATER
Produces
GAS LOAD
in the
UPPER BRACKETS
Where the
PROFIT IS GREATEST
★
The Republic Plan Already Working for Seven Major Utilities
★
AUTOGAS CORPORATION
Chicago, Illinois

GASAIR

GASAIR MIXERS AND VAPORIZERS
150 to 50,000 C. F. H. Capacity
●
GASAIR VAPORIZERS
For Straight Vapor Installations

ELIMINATE UTILITY & INDUSTRIAL SHUT-OFF

"The Only Complete Gas-Making Unit Operating Without Outside Power"
●
GASAIR CORPORATION
John K. Heller, Pres.
155 Sansome Street, San Francisco
Telephone YUkon 1435

STANDBY

has served as General Counsel since January, 1939, is resigning to return to law practice in his firm of Robinson and Robinson in Columbia, S. C.

Since January, 1939, he has served as Counsel for the National Power Policy Committee and as Chief Counsel of the Power Division of the Public Works Administration. He has also acted as Counsel for the Power Authority of the State of New York.

Charles E. Wagner, for 10 years with the Detroit-Michigan Stove Co., resigned as Kansas City, Mo., manager on February 29 to take over the sales direction west of the Mississippi for Pittsburg water heaters. **Ray Houdek,** who has been contacting the Gas Service Co. organization for Garland ranges, will replace Mr. Wagner as Kansas City manager.

George R. Schaughency, System operator, Equitable Gas Co., Pittsburgh, was recently presented with a 40-year service emblem by H. H. Pigott, general superintendent of production and transportation. **James E. Keenan,** of Division "C" in the distribution department of the same organization, has graduated into the "Veteran's Association" as a result of having served his company 35 years.

Edward Holland, chauffeur in the transportation department of the Brooklyn Union Gas Co., Brooklyn, N. Y., has established a 10-year record for no accidents while driving passenger cars and trucks through the crowded streets of Brooklyn. Altogether, he has covered 77,145 miles in company cars in that time without even clicking bumpers with another car, according to company records. This gives him top ranking in the list of 81 transportation division chauffeurs who have maintained perfect no-accident records for periods ranging from 1 to 10 years. No other driver in this class, however, has gone more than eight years without an accident.

J. H. Schmidt has been appointed direct factory representative in the state of Texas for the Pittsburg Water Heater Corp., whose headquarters are in Pittsburgh. Mr. Schmidt's offices will be at 3300 Main Street, Dallas. The appointment was effective March 1.

Directors of Southern Counties Gas Co., Los Angeles, Calif., elected **W. J. McCoy** treasurer, and **Joseph Sodoma** assistant secretary, at their meeting March 20. These positions had been held by **Fred Champion,** who retired from active service on April 1 in accordance with the company's uniform pension and benefit plan.

FRED CHAMPION

Mr. Champion has been identified with the organization since 1913, when he was employed as district agent in Santa Ana. Between 1913 and 1919 he worked in various capacities in Santa Monica, Pomona and San Pedro, and became test engineer in the general office, with headquarters in Los Angeles, in 1919. He was elected assistant secretary of the company in 1931, and treasurer in 1934.

Mr. McCoy is comptroller and director of the company, and Mr. Sodoma is assistant to the vice president and general manager.

G. W. L. R. Travis and C. C. Simpson, Jr.

C. C. Simpson, Jr., engineer of gas distribution, and **G. W. L. R. Travis,** assistant engineer of gas distribution, recently completed 25 years of service with the Consolidated Edison Co. of New York. During this period Messrs. Simpson and Travis were instrumental in introducing air power tools and mechanical equipment in distribution work.

Mr. Simpson joined the company in 1904, and served as captain of engineers in the American Expeditionary Air Forces in France in 1917 and 1918. Mr. Travis joined the company in 1915.

Fred Carpenter has been named as local manager of the Cement,, Okla., division of the State Fuel Supply Co. The transfer was made on December 15. Mr. Carpenter served as local manager at Carnegie and prior to that in Anadarko.

L. A. Horn, Jr. is the new business solicitor for the Stamford district of Community Natural Gas Co., Dallas, Texas. He replaces **T. H. Miller, Jr.,** who has been transferred to Wichita Falls, Texas. Mr. Horn formerly lived in Eastland and began his association with the company in Sherman, Texas.

Joseph G. Mallory, for 22 years superintendent of the gas measuring department, Hope Natural Gas Co., Clarksburg, W. Va., has retired recently after serving the gas industry for 35 years.

Games Slayter of Toledo and Newark, Ohio, who founded the Fiberglas industry by transforming glass into thread-like fibers, received the award of a "Modern Pioneer," presented to outstanding inventors and research workers by the National Association of Manufacturers, February 21. The awards to "Modern Pioneers" were made in celebration of the 150th anniversary of the founding of the United States Patent System.

Fiberglas is used for insulation purposes in refrigerators, gas ranges, and in the walls of homes.

F. H. Mugg has been made manager of the Lawton, Okla., division of the Consolidated Gas Utilities Corp., to succeed **Paul S. Pierson,** resigned.

Mr. Mugg formerly was with the Oklahoma Gas & Electric Co. when it distributed natural gas in Oklahoma City. Later he held executive positions with the Industrial Gas Co., Oklahoma City, and the Oklahoma Natural Gas Co., Tulsa.

Three Hundred Attend CP Meeting in Oklahoma City

THREE hundred representatives of natural gas utilities, manufacturers, jobbers and dealers in gas ranges and equipment, attended a meeting at the Huckins Hotel, Oklahoma City, Okla., February 27 to hear a talk by John E. Bogan, of New York City, sales counselor of the Association of Gas Appliance and Equipment Manufacturers. The meeting was sponsored by the Oklahoma Natural Gas Co., assisted by the Central States Power & Light Corp., Consolidated Gas Utilities Corp., and Southwest Gas Co.

The meeting was a part of a nationwide CP gas range campaign, sponsored by the Association of Gas Appliance and Equipment Manufacturers, and the American Gas Association. A cooperative budget of $110,000, almost double the amount set aside for last year, has been appropriated to aid a field staff to conduct sales training and educational development work for dealers, jobbers, distributors and utilities and to assist in planning and conducting local CP campaigns.

The meeting was in charge of H. Vinton Potter, advertising manager, Oklahoma Natural Gas Co., Tulsa. John H. Warden, sales manager, Oklahoma Natural Gas Co., was a principal speaker.

■ ■

Two Ohio Gas Companies Consider Consolidation

The Ohio Fuel Gas Co. and Northwestern Ohio Natural Gas Co., both of Columbus, have laid tentative plans for merging the two companies, and the installation of additional pipe lines involving the expenditure of several hundred thousand dollars. According to E. M. Tharp, vice president of the Ohio Fuel Gas Co., the negotiation for an acceptable rate would be followed by an expansion program which would permit a larger supply of gas for Toledo. John B. McMahon, counsel for the gas companies, said there would be no further reason for two companies if the natural and artificial rates are brought into thermal parity so that a consumer would not care which type of service reached his home.

■ ■

Jeffersonville, Ind., Will Change To Natural Gas

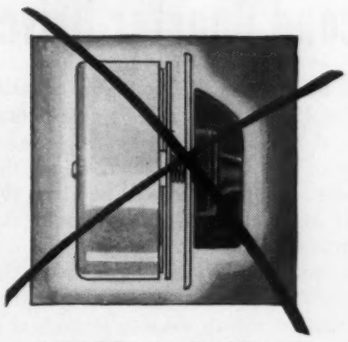
Jeffersonville, Ind., will soon be using natural gas instead of the manufactured product that has been served in the past as the result of a resolution passed by the city council on March 4. The contract for supplying the natural gas has been awarded to the Public Service Company of Ind., and all that is now delaying service is an approval of the contract by the Indiana Public Service Commission and the establishment of a rate schedule.

The B.t.u. content of the natural gas will be 900, as compared to the 570 B.t.u. of the manufactured gas formerly served.

■ ■

United Gas Completes Move To Shreveport Quarters

The new $750,000 office building which will house employes of the United Gas Pipe Line Co., the Union Producing Co., and the United Oil Pipe Line Co. has been completed in Shreveport, La., and the transfer of 250 employes who were formerly stationed in Houston has been made. Altogether, there will be approximately 500 employes of the three companies occupying offices in what has been named the United Gas Building.



Model TX—Not Good Enough

X MARKS THE SPOT

This old timer is dead. As far as we're concerned, it's buried.

The sketch at the left above represents the old Model TX timer for kitchen ranges. MARK-TIME developed it, introduced it, promoted it. We thought it was great ... *then.* But the square-edged bell isn't truly a bell. Its very design makes tonal quality impossible. We dropped that model like a hot potato when our engineers developed the current popular, proved Model ST.

MARK-TIME Model ST is unquestionably today's leader. Only MARK-TIME offers these exclusive features and their real advantages.

NEW RESILIENT ESCAPEMENT (protected by patent application), the first important improvement in that kind of mechanism in over 100 years. It takes hard knocks in factory, field, and home, and *won't* stall. It virtually eliminates servicing and rejections. It cuts the tick down to a whisper.

It Gives You a PATENT-APPLIED-FOR COMBINATION of

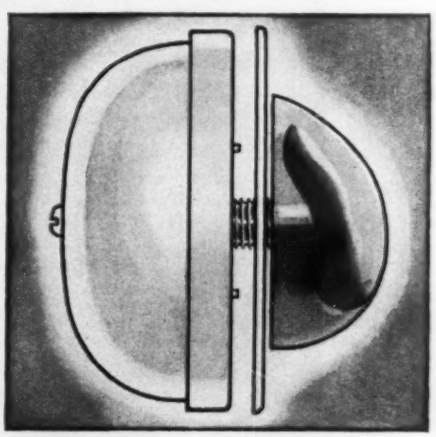
CENTER STUD MOUNTING — quick, secure, requires no bothersome mounting plates and only one ⅜" hole. Allows 30-second installation by unskilled help.

PLUS "TRUE BELL-SHAPED BELL" — struck from inside; emits single, melodious, resonant note that carries throughout a home. Houses the movement.

PLUS PUSH-ON KNOB — designed to permit sure grip without damaging feminine manicure . . . and smart-patterned (design patented) escutcheon plate.

Timers are no sideline assembly job with us — timing devices make up our entire output; we build them from the ground up. Many alert range manufacturers are doing right by the trade and its customers — specifying MARK-TIME Model ST for their new models.

MARK-TIME Model ST
Today's Leader of the Timer Field



MARK-TIME Timing Devices are manufactured under one or more of the following patents: 109734, 110529, 1353850, 1773697, 1795969, 1895398, 1895399, 1916867, 1934611, 1938721, 1943839, 1929793, 1951490, 1952893, 1956998, 1959645, 1969034, 1995363, 1996173, 2001266, 2087071, and patents pending.

MARK-TIME TIMING DEVICES for Every Application

M. H. RHODES, INC. HARTFORD, CONN.

Refrigeration Starts Second Quarter Drive

THE current year-round sales campaign for gas refrigeration, known as "Life Begins in '40 for Gas Refrigeration," and sponsored by the American Gas Association, has as its theme for the second quarter drive the slogan, "Pioneers of Progress," which is intended to symbolize "new horizons and new frontiers" for this branch of the gas industry for the months of April, May and June.

Twenty-four gas utilities, making the best showings, will be given cash awards to be used for victory dinners for members of their sales forces, according to Bernard T. Franck, chairman of the American Gas Association refrigeration committee, and other prizes will be a handsome scale model of a Pan-American clipper ship to utilities leading their respective divisions; six "honor flights" to Bermuda for those salesmen who lead their divisions in sales, and monthly and quarterly cash awards for top salesmen. Each of the home service departments of the winning companies will receive a cash award in the second quarter campaign.

At the end of the first nine months of the 1940 campaign, 30 representatives of the 24 gas utilities in various parts of the country which attain the highest selling record will be given the thrill of a clipper plane trip to the Bermuda Islands.

In spite of the cold weather of the past January, sales of gas refrigeration during that month were so large that it was proved conclusively that refrigeration can be sold at any time during the year. Twenty-six companies were honored with the distinction of being the leaders of the month and 161 salesmen were awarded cash prizes for their sales accomplishments.

■ ■

Community Natural Starts Service in Four Towns

Community Natural Gas Co., Dallas, Texas, has started service to a group of four new town plants in Leon and Madison counties, Texas, gas being supplied through a 50-mile, 8-inch transmission line recently completed by Lone Star Gas Co. from Leon county gas fields to Bryan.

More than 400 new subscribers for gas service were added to the list of Community Natural's customers with the completion of these plants in Madisonville, Centerville, Normangee, and Leona. Largest of the group was Madisonville, where 250 customers were scheduled to receive service shortly after the distribution plant was completed and gas turned into the mains on March 6.

The new Lone Star pipe line, first major pipe line construction by the company since 1937, was built to augment supply to the company's line serving College Station and Bryan, which are located at the southern end of the interconnected Lone Star system.

■ ■

Industrial Sales Discussed At Two-Day Toledo Meeting

THE American Gas Association Conference on Industrial Gas Sales was held at the Commodore Perry Hotel, Toledo, Ohio, March 28-29. The two-day session was filled with papers and discussions of questions pertinent to industrial gas sales in 1940, including customer reaction, market development, merchandising, competition, management, the possibilities of gas as a chemical, sales planning, promotion, new techniques, trends of the day and the special problems of individuals and firms.

The program was arranged under the chairmanship of Ralph S. Wenner, The Ohio Fuel Gas Co., Toledo, and the four half-day sessions were presided over by Franklin T. Rainey and H. Carl Wolf, chairman and vice chairman, respectively, of the Industrial Gas Section of the American Gas Association.

The Conference also constituted the spring meeting of the Midwest Industrial Gas Sales Council of the Industrial Gas Section, whose chairman. Nelson R. Gorsuch, led a large delegation to Toledo.

■ ■

New 169-Mile Line Planned From Saskatchewan Fields

Construction of a $5.000,000 natural gas distributing system in the western province of Saskatchewan, Canada, has been planned by the Northern Natural Gas Co., which is a subsidiary of Franco Oils, Ltd., a Canadian company. Final arrangements will not be made until after a plebiscite is held early this spring in Saskatoon, where 50% of the rate payers must approve the franchise for the system.

Present plans call for the construction of a 169-mile pipe line from the Lloydminster gas field on the Saskatchewan-Alberta border to Saskatoon. Branch lines will be constructed to serve the communities of North Battleford and adjacent towns. Under the terms of the franchise, the gas must be produced within the borders of Saskatchewan.

■ ■

Memorial Booklet Being Published for L. B. Denning

The humanitarian activities, both business and civic, of L. B. Denning, late president of Lone Star Gas Corp., were so numerous that a memorial booklet is being published. The booklet will be distributed to Lone Star employes and the many friends of Mr. Denning, as a tribute to his memory. It will include the story of his rise from water boy for a railroad, to president of one of the largest gas distribution systems in the world.

■ ■

Indiana Utility Moves

The Wabash Public Service Corp., Petersburg, Ind., has recently leased the first floor of the I. O. O. F. building in Petersburg, for its office and display room. The Wabash Public Service Corp. was formerly known as The Petersburg Natural Gas Co.

LOW WATER CUT-OFFS

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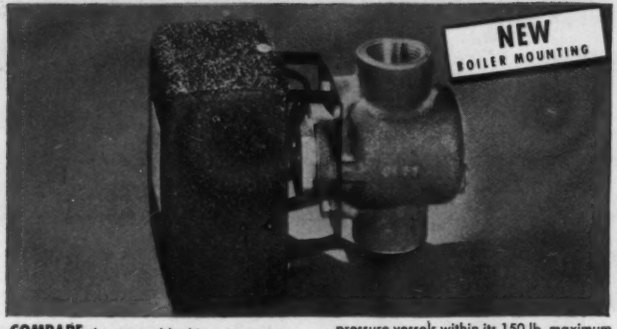

COMPARE these good-looking, compact, light weight, boiler mounting cut-offs with the ponderous conventional float type cut-outs. These new controls are designed primarily for boilers requiring 1" I.P.S. connections and high pressure control. Also may be used on tanks, receivers and other pressure vessels within its 150 lb. maximum operating pressure limit, with temperatures up to 366° F. maximum. Available for both low voltage and line voltage and motor capacities. Alarm circuit optional on all line voltage models.

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■ ■

For more information **"ring 3789"** on coupon

Valve Slide Chart

Trade Name: "Figure Number" Chart Form V-130.

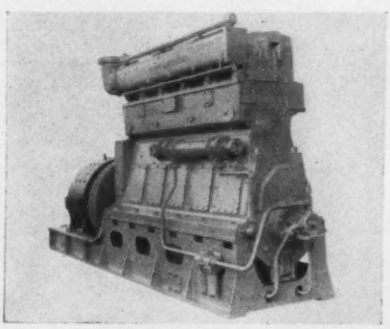
Application: A chart permitting engineers to ascertain the figure number of the valve in any available size for any pressure, and which, by simple manipulation, locates and classifies the information.

Description: The various tables are made up and remade by sliding a card back and forth under window openings in the slide holder. It simplifies selection of the proper types of Nordstrom lubricated valves to replace other valves of various pressure ratings. The chart includes information on semi-steel, steel and malleable iron valves. —*Merco Nordstrom Valve Co., 400 Lexington Ave., Pittsburgh, Pa.*

■ ■

For more information **"ring 3790"** on coupon

Diesel Engine



Trade Name: Type JS Diesel Engine.

Features Claimed: This four-cycle type Diesel engine adds further to the over-all efficiency and economical operation of the vertical Diesel engine, and at the same time increases horsepower. The base of the Type JS Diesel engine is divided close to the centerline of the crankshaft, and the cylinder block is bolted to it by steel tie-bolts extending to a point just above the crankcase covers. The cylinder liners are fitted with oil-proof grommets at their upper and lower ends to seal the water joints. The crankshaft is a one-piece steel forging with a diameter of nine inches. The undersides of Type JS piston crowns are jacketed and oil cooling is provided. This oil cooling of pistons is a new feature of "J" line engines and goes far towards eliminating wear, at the same time assuring lower piston temperatures, which permits higher speeds and greater horsepower output. The Type JS lubricating system is of the pressure-circulating type. —*Cooper-Bessemer Corp., Mt. Vernon, Ohio.*

■ ■

For more information **"ring 3791"** on coupon

Shaper Tool

Trade Name: Kennametal Shaper Tool.

Application: A standard steel-cutting shaper tool tipped with Kennametal grade KS, for use on shapers and planers in order to machine steel of hardness up to 550 Brinnell.

Features Claimed: A feature of these new tools is the unusual tool angles employed, namely: 10° negative back rake, 5° negative side rake, 15° side cutting edge angle and 2° clearances. These tool angles are made possible by the low frictional resistance between Kennametal and the work being cut. As a result, less frictional heat is developed. With these tool angles it is unnecessary to lift the tool on the return stroke. Kennametal shaper tools will shape steel of hardnesses above the machinable limit for high speed steel tools at high speed. Kennametal KS has a hardness of 76 Rockwell C but has a strength of 322,000 lbs. per sq. in. The sizes of tools that can be furnished will fit in standard clapper boxes of shapers and planers.—*McKenna Metals Co., Latrobe, Pa.*

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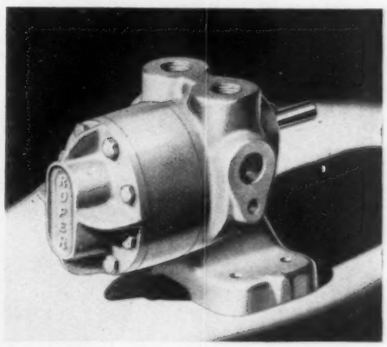
Rotary Pumps



Trade Name: Roper Rotary Pumps.

Features Claimed: Containing over 7000 different units, this line includes pumps of 1, 3, 5, 10, 15, 20, 35, 50, 75, 100, 150, 200, 300, 500, 750 and 1000 g.p.m. capacities at speeds up to 1800 r.p.m. and against pressures up to 1000 lbs. per sq. in. At present 21 different drives and mountings are available ranging from ordinary foot, hub and flange mounting heads to complete bedplate units for direct motor drive; gear reduction; flat or V-belt drive. An outstanding feature of this new line is "hydraulic balance." It equalizes internal pressure at all points and absorbs all shock or thrust from power end of drive shaft. Other features include your choice of spiral, spur or herringbone gears; conventional packing box, spring loaded packing box or mechanical seal; sleeve or roller bearings; built-in or external relief valve; eight different piping arrangements.—*Geo. D. Roper Corporation, Rockford, Illinois.*

■ ■

For more information **"ring 3793"** on coupon

Mud Conditioner

Trade Name: Rex Mud Conditioner.

Application: A conditioner for rotary drilling mud.

Features Claimed: Designed to meet the requirements of present-day drilling practices and to insure high capacity clean screening at low cost. It is designed for the removal of shale, sand and cuttings from rotary drilling mud for low cost and trouble-free operation. Some of these features are: A 20 sq. ft. screen area, a screen

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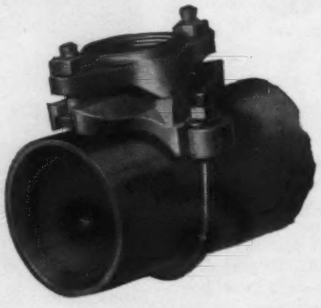
Meter Leveling Saddle for Pipe Lines



DESIGNED FOR ACCURATE LEVELING OF METERS

This new type of saddle for oil and gas pipe lines brings about a more accurate leveling of meters. It can be fitted to lines from 2" to 26" in diameter by means of a U-bolt that fits into slots in the saddle body.

These slots, in place of holes, make removal of the U-bolt easy even after the threads and nuts have become rusted. Top surface of slots are machined at a slight angle to prevent the U-bolt loosening or slipping off. The saddle makes a three-point contact, permitting accurate leveling over a 14-degree angle

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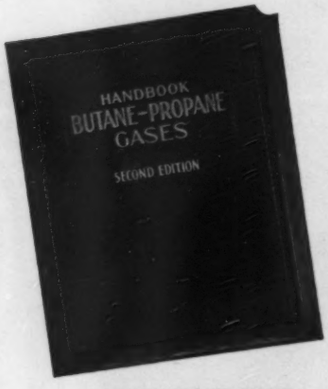

415 Pages

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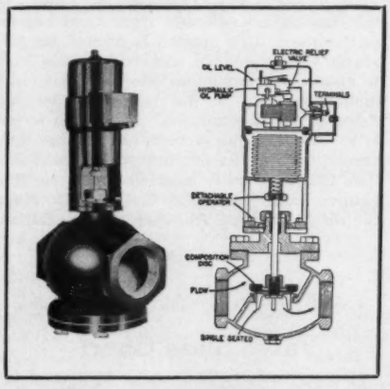
which stretches crosswise and lengthwise eliminating dead spots, cushion rubber screen cloth support, stainless steel screen cloth, oil-lubricated vibrator and feed control gates. The Rex mud screen is a low head-room, compact unit ruggedly built complete in itself and easily moved from one location to another.—*Chain Belt Co., 1619 W. Bruce St., Milwaukee, Wis.*

■ ■

For more information **"ring 3796"** on coupon

Hydramotor Valve



Trade Name: General Controls Hydramotor Valve.

Application: For handling air, gas, water, oil (any gravity, any grade), brine, saturated steam, etc.

Description: The valve is of the full-ported single-seated type and affords 100% tight shut-off in any position. The electric pilot valve has a simple, two-wire, current failure control, with low current consumption —60 VA during the opening cycle and 5 VA when open. No gears are used and there is only one internal switch. The entire operator is totally enclosed, sealed in oil, and is drip-proof. All moving parts are bathed in oil. The entire operator is detachable from the valve body. The valve itself is normally closed; applying current opens the valve. Approximate opening time is 45 seconds; approximate closing time, 10 seconds. Because of the wide variety of services to which this valve may be put, composition discs in the valve body are furnished to suit the service. Style "F" disc is for air, brine, butane and natural gas, light oils, and water of temperatures not exceeding 125° F.—*General Controls Co., 700 W. Ivy St., Glendale, Calif.*

■ ■

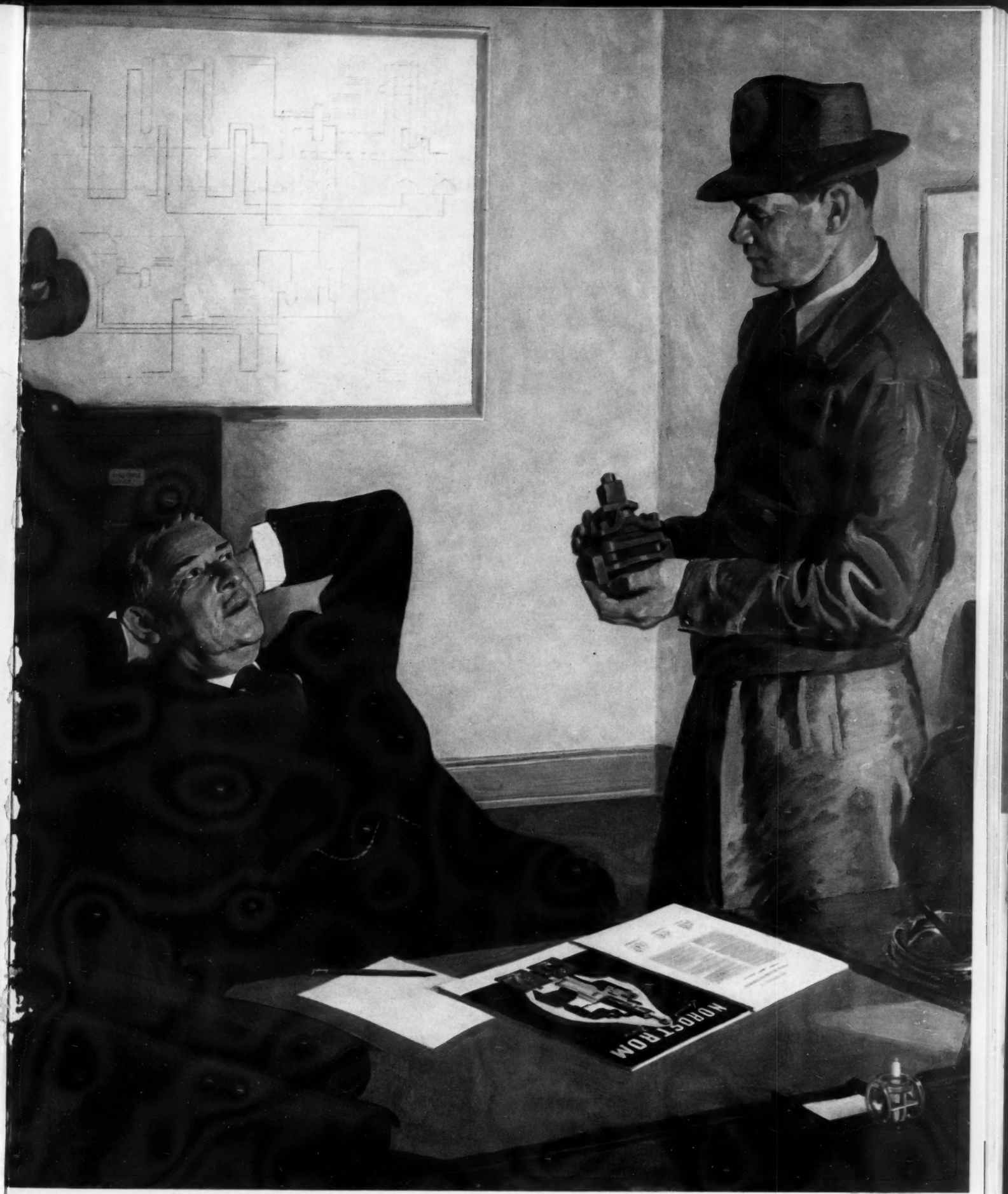
For more information **"ring 3797"** on coupon

Butane-Propane Hose

Trade Name: Butane-Propane Gas Hose.

Application: A hose specially designed to meet the problems of handling "bottled" gas.

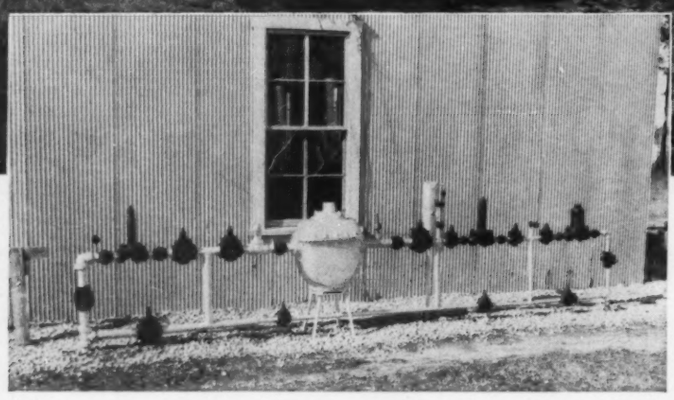
Features Claimed: The Butane-Propane hose is of combination construction, with synthetic tube and rubber cover, in sizes ranging from ⅜ in. to 3 in. in diameter. All sizes ½ in. and larger have built-in static wire. One factor which has made these gases safe to use in homes, retail establishments and industries has been the development of special hose to handle them. The synthetic tube used protects against any action of the gases, while the reinforced wall has been built to withstand all the pressures used.—*The B. F. Goodrich Co., Akron, Ohio.*



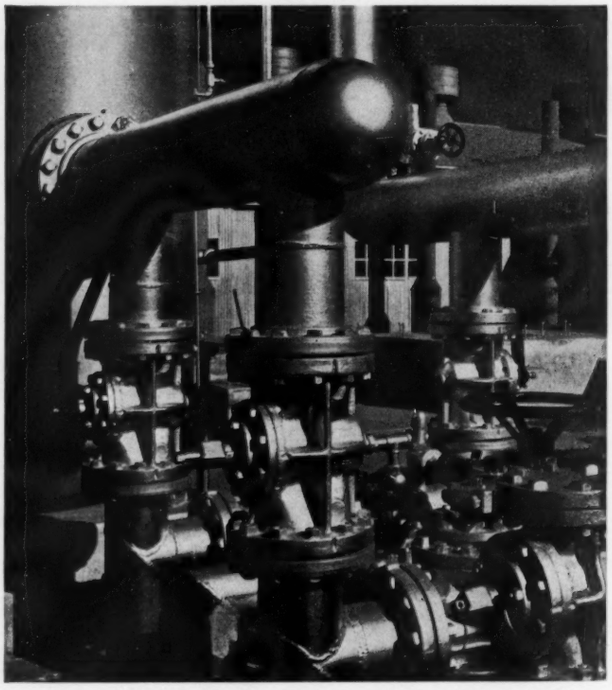
"You're right, son! Nordstrom Valves might cost more to buy, but they cost less to use, because of positive, uninterrupted operation, with leakage and repairs eliminated."

NORDSTROM VALVED LINES *never need watching*

Above: Take-off for natural gas in a California gas field controlled with Nordstrom Valves.



EMCO Gas Meter and Regulator setting equipped with Nordstrom Valves on fuel gas line.



Nordstrom Valves in an industrial fuel plant at Wilmington, Calif.

IN POINT OF SAFETY, Nordstrom Lubricated Valves offer "full-coverage" insurance. The plug being completely sealed within a viscous film of lubricant, leakage is prevented internally and externally. There are no overhead yokes to rust or exposed stems to corrode. In point of economy these valves cost the least. For every $1,000 worth of Nordstrom Valves placed in service during the past 18 years, the cost of replacement parts has averaged less than $5.00. They are virtually indestructible. Change to Nordstroms.

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Pipe-Laying Machine

Trade Name: Cleveland Model "80."
Application: Performs three important operations incidental to every pipe-laying job.
Features Claimed: The three operations referred to are backfilling, tamping and pipe-placing, and the machine is the Cleveland Model "80." One of the special features of this machine is that when backfilling it can work from either side of the ditch and the dirt can be either pulled in or pushed in, by the scraper. A light dirt scraper permits backfilling, where dirt has been placed on sidewalks or lawns, without damage. When necessary or desired, a heavier scraper can be quickly attached. Tests with the Cleveland Model "80" have proven that it meets completely every requirement for a most efficient small backfiller, saving materially on the time normally taken for this type of work.

The Model "80" is equipped with a built-in tamping device which drops a weight of 175 pounds 45 times per minute, with a resultant impact of 380 foot-pounds. Because of the gearing, these blows overlap considerably and both the force of the blows and their regularity are held absolutely uniform. It has been demonstrated repeatedly that the Model "80" can replace as much, or more, dirt in the trench as was originally taken out. It is often possible to pull the dirt in with the backfill scraper, as tamping progresses, thus creating practically a 100% machine operation, adding materially to the savings. The tamping boom is quickly movable, permitting tamping with the machine astraddle of the trench or as much as 3½ feet from the edge of trench. Hundreds of miles of trench for cast-iron, steel and clay pipes and conduits have been successfully tamped with this unit and it is common practice to replace concrete base or pavements immediately after tamping has been done.—*The Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland, Ohio.*

■ ■

For more information **"ring 3799"** on coupon

Steel Safety Stamps

Trade Name: Light Bevel Safety Stamps.
Description: A light bevel stamp which will not only prevent accidents from mushrooming and spalling, but due to the alloy steel used, it is possible to have a stamp with the strength of ordinary heavy bevel stamps while at the same time being 35% lighter. This lightness makes the light bevel safety stamp much easier to handle, and in stamping finished surfaces it is possible to obtain a high degree of accuracy.—*M. E. Cunningham Co., 115-117 E. Carson St., Pittsburgh, Pa.*

■ ■

For more information **"ring 3800"** on coupon

Machine-Vibration Isolator

Trade Name: J-M Controlled Spring Isolator.
Application: To economically control machine vibration and reduce the resulting noise.
Features Claimed: The machine was developed for use on the bases of motors, generators, pumps, ventilating fans, and similar equipment where vibration and excessive motion create noise and tend to wear out machine parts and damage connections as well as crack the supporting walls and floors. The working parts of the unit consist of a coil spring and a rubber load pad, which support the equipment and isolate vibration, and an adjustable rubber snubber inside the base, which controls excessive motion. Through the combination of these parts, the isolator provides both the high compliance necessary for good isolation and the control needed to limit motion in the equipment. The isolator was built to take care of horizontal and torsional as well as vertical vibration, and tests indicate it to be particularly efficient for the low frequency vibrations resulting from slow speeds and from many operations involving reciprocal action. The load pad is designed to overcome any high frequency vibrations. The isolator is made in two sizes, light duty and heavy duty, and is enclosed in a metal jacket which protects the rubber parts from oil and light.—*Johns-Manville, 22 E. 40th St., New York, N. Y.*

■ ■

For more information **"ring 3801"** on coupon

Variable-Pitch Fan

Trade Name: Kontrol-Fan.
Application: Designed for cutting the cost of fuel on internal combustion engines.
Features Claimed: Fuel economies as great as 10 per cent have been shown by operation tests of thermostatically controlled, variable-pitch fans on many types of internal combustion engines. These savings are accomplished by maintenance of the most efficient engine operating temperatures under all weather and load conditions. The thermostat causes the variable-pitch fan blades to move into the correct position for the necessary air movement to hold this effective temperature, which is then automatically maintained. Both air and water-jacketed thermostats are available, but there is no direct contact between the thermostat and the cooling water. In addition to holding the engine at optimum temperature, further economy is effected when cooling is not required. Then the fan blades flatten out and take no power. The sole adjustment is by the thermostat, which is sensitive and accurate. The life of fan belts has been materially increased.—*Kontrol-Fan, Inc., Pasadena, Calif.*

■ ■

For more information **"ring 3802"** on coupon

Metallic Coating

Trade Name: Corronite.
Application: A metallic pore-free coating developed to offer corrosion resistance.
Features Claimed: A thin coating produced by the Corronizing process has been found to give effective protection against severe corrosion. With this coating, the metals making up the coating can be applied in many ways. The composition can be controlled so closely that coatings varying in thickness and properties can be provided to fit the service conditions to be encountered. As a metallic protection to ordinary low-carbon steels, the coating permits their use in all types of fabrications exposed to weather as well as to corrosive action of acid vapors and various solutions. Another important feature of the new coating is that objects may be welded without reducing the corrosion-resistant properties of the coating.—*Standard Steel Spring Co., Corapolis, Pa.*

Before You Buy, Consult the *Latest Trade Literature* Concerning Equipment

This department of GAS will gladly mail you without obligation any of the selected bulletins listed below. Use the coupon on page 55 of this issue, indicating by number above those you desire.

For more information **"ring 3803"** on coupon

Brown Mechanical Flow Meters, Catalog 2203, covers the complete line of mechanical flow meters, indicators, recorders, and air operated flow controllers. Desirable operating advantages are described in detail.

For more information **"ring 3804"** on coupon

A new 90-page catalog has been issued by the Consolidated Safety Valve Division of Manning, Maxwell & Moore, Inc. The new catalog explains in detail the self-cleaning outside bevel seat, and several pages have been devoted to steel pipe flanges and flanged fittings.

For more information **"ring 3805"** on coupon

A bulletin on steam traps used in steam distribution systems, heating equipment, and many kinds of process machines, has just been announced by the Yarnall-Waring Company. The bulletin contains 16 pages and is titled Yarway publication T-1735.

For more information **"ring 3806"** on coupon

"Metcolizing" is the title of Bulletin P-11 issued by the Metallizing Engineering Co., Inc. This bulletin tells what metals and equipment can be metcolized.

For more information **"ring 3807"** on coupon

The Marmon-Herrington All-Wheel-Drive Pictorial News tells a graphic story on the amazing ability of vehicles to traverse desert sands, plow through deep snow, climb hills, and penetrate forests. The book is a large 16-page magazine with several illustrations.

For more information **"ring 3808"** on coupon

American Chain & Cable Co., Inc., have just published a new edition of their No. 365 catalog on welded chains. A feature of this publication is a 2-color, 16-page insert devoted to ACCO Registered Sling Chains, and covering the Endweldur Chains.

For more information **"ring 3809"** on coupon

A booklet showing the mechanical features and capacities of the Caterpillar Tractor Co. tractors and road machines, has recently been announced by the company.

For more information **"ring 3810"** on coupon

A 12-page publication by the Chicago Pneumatic Tool Co., has just been issued covering concrete vibrators. The booklet gives general information on the selection, principles of design, and how to care for the concrete vibrator.

For more information **"ring 3811"** on coupon

The General Electric Co.'s new booklet GEA-1184D describes the A-C magnetic motor-starting switch and lists the distinctive features of the switch. GEA-3301 and GEA-2915A features in detail the Reactrol System and Capacitor Motors, respectively.

For more information **"ring 3812"** on coupon

Three new circulars, AD214, AD215, and "What You Should Know About Fire Extinguishers" describes and illustrates the Pyrene Manufacturing Co.'s fire extinguishers. These booklets are referred to as "a short course in first-aid fire protection."

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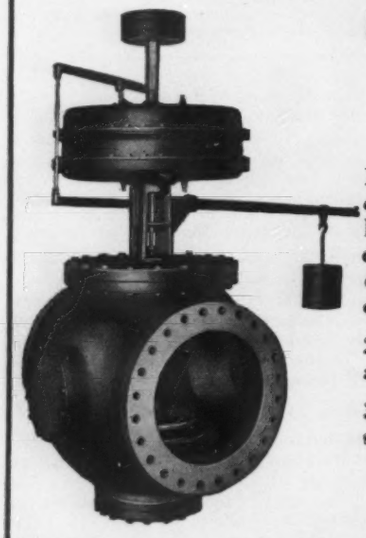

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Home Study Course Students To Receive A.G.A. Prizes

PRIZES of $50 will be awarded by the American Gas Association to the students completing with the most comprehension the home study course on American Gas Practice offered by Columbia University and the home study course on Natural Gas offered by the University of Kansas during the year from September 1, 1939, to September 1, 1940. These two cash prizes are being offered by the Committee on Personnel Practices, of which H. L. Donaldson of the Equitable Gas Co. of Pittsburgh is the chairman, the money being made available through the Trustees Gas Educational Fund administered by the A. G. A. Selection of the recipients will be made by the educators conducting the courses.

Both courses are sponsored by the A. G. A. and are supervised by advisory committees made up of eminent gas engineers appointed by the Association. The course on American Gas Practice offered by Columbia University is divided into two parts — part I treating the production of manufactured gas; and part II dealing with the distribution and utilization of gas. The course on Natural Gas offered by the University of Kansas covers the entire field of natural gas, from origin to utilization.

Detailed information on these two home study courses, enrollment in which can be made at any time, will be supplied by the Association.

■ ■

Four-Color Book Published To Aid Sales Promoters

A four-color, 16-page booklet, "Let Me Tell You About My Modern All-Gas Home," prepared by Evans-Winter-Hebb, Inc., Detroit, Mich., publishers of the gas utility magazine, *Today's Home*, is being made available to gas company salesmen, home service girls and promotion managers through the courtesy of M. W. Welty, advertising manager of the Philgas Department, Phillips Petroleum Co., Detroit. With few words and many illustrations, the book portrays the use of gas for the four big jobs and presents the sales story step by step.

Copies may be obtained from Evans-Winter-Hebb, Inc., Detroit, at a cost of $75 per 1000.

■ ■

Western Land Opened For Oil and Gas Prospecting

More than 1,500,000 acres in 13 western states were opened during March for prospecting and development of oil and gas resources under the provisions of the Federal leasing laws.

The land comprises tracts formerly held under old oil and gas prospecting permits which were ordered terminated by the leasing act, and for which the holders failed to seek their exchange for new five-year leases as required by law in order to continue their right to prospect the land.

■ ■

Robert R. Berry, Advertising Executive, Passes

Robert R. Berry, first art editor for Western Business Papers, Inc., publishers of *Western Gas* (now *GAS*) and more recently advertising manager for the Pennzoil Co., Los Angeles, passed away last month after a brief illness. Mr. Berry, who designed the first cover for *Western Gas*, was well known among gas and oil men on the Pacific Coast.

Wisconsin Utilities Convention Records Attendance of 424 Registrations

ALL previous attendance records were broken when 424 persons registered March 11 and 12 in Milwaukee for the annual convention of the Gas Section of the Wisconsin Utilities Association. The former high mark was 290 in 1937, it has been reported by A. F. Herwig, executive secretary.

The high spot of the program was the "Cavalcade of Gas," directed by E. Carl Sorby of the Geo. D. Roper Corp., in which the history of the accomplishments of the industry was reviewed and the future possibilities in selling gas service were portrayed. Stage settings were under the direction of L. A. Dubberke, chairman of the Commercial Section. Speakers on the program included Walter C. Beckjord, president of the A. G. A., Bruno Rahn, president of the Wisconsin Utilities Association, and Bernard T. Franck, vice president, Milwaukee Gas Light Co. An original home service skit was presented by Ruth Arensen and Gertrude Berg of the Milwaukee Gas Light Co.

Paul DeLeon, Wisconsin Power & Light Co., Madison, was elected chairman of the Commercial Section to succeed L. A. Dubberke, Milwaukee Gas Light Co., and C. A. Debell, Wisconsin Public Service Corp., Sheboygan, was elected vice chairman. H. E. Sweet, Wisconsin Power & Light Co., Madison, was elected chairman of the Technical Section, succeeding G. A. Anderson, Wisconsin Public Service Corp., Sheboygan, and O. W. Barenscher, Wisconsin Public Service Corp., Sheboygan, was named vice chairman.

■ ■

Peoples Gas & Coke Company Stages Special Showing of Ranges

Modern 1940 gas ranges were presented by the Peoples Gas Light & Coke Co., Chicago, in cooperation with 21 gas range manufacturers, to 1000 Chicago department store men, furniture, hardware and major appliance dealers on February 27 in the Hotel Stevens. Marvin F. Boss, manager, Dealer Division of Peoples Gas Light & Coke Co., introduced the after-dinner speakers, who were: B. H. Wittmann, manager, Domestic Sales Department; F. X. Mettenet, vice president; R. S. Agee, sales promotion manager of the A. G. A. E. M., and J. T. Meek, executive secretary of the Illinois Federation of Retail Associations.

The ranges were displayed in pyramid formation on a specially built dias against a velvet background. A glittering sign 14 ft. in diameter topped the peak.

■ ■

Look For "A Baker in the House" in This Month's McCall's Magazine

In this month's issue of McCall's Magazine appears an article entitled "Is There a Baker in the House?" which extolls the gas range for cooking the kind of substantials and dainties that give more than a little promise of reawakening the interest of the housewife and her family in home-cooked meals, and that offers fine help to salesmen in the field. Reprints are available in any quantities.

McCall's has also prepared mats of a newspaper article of practically the same substance, and these are available to dealers.

Ruth Soule, director of Home Service for the Brooklyn Union Gas Co., Brooklyn, N. Y., prepared the magazine material.

■ ■

Houston's All-Gas "Talking Home" Attracts Thousands of Visitors

The all-gas "talking home," exhibited by the University Oaks Co. in Houston, Texas, was visited by many thousands of interested visitors during February and early March, 12,000 having made inspection on one Sunday alone.

Gas is used throughout the home for cooking, heating and refrigeration. The all-gas kitchen was sponsored by the Houston Gas and Fuel Co. and the Houston Natural Gas Co.

Special wiring and sound equipment made possible an ingenious method whereby questions asked by the throngs were answered by the walls, gas appliances and fireplaces.

■ ■

Oklahoma Utilities Company Plans To Increase Gas Supply

An expenditure of $50,000 for the construction of a 10-mile gas line into the Paden, Okla., fields to assure Bristow and Drumright, Okla., an adequate gas supply has been authorized by the Oklahoma Utilities Co., Bristow, it was announced recently by C. H. Rainwater, manager. In a special election held in Drumright, a new 25-year franchise was voted to the Oklahoma Utilities Co.

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REYNOLDS Builds a Regulator for every type of Gas Control Installation. Proved by records of performance in actual operation, or by records of factory tests on new developments, every REYNOLDS unit—whether for high pressure or low—is a proved product.

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Low Pressure Service or Appliance Regulators
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High Pressure Line Regulators Pilot Loaded—Pilot Controlled
Toggle Type Regulators. Single Valve, Double Valve, Triple Outlet
Seals: Dead Weight or Mercury
Relief Valves: High or Low Pressure
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Leak Detection

Rapid and inexpensive detection of gas leaks by analysis of effect on trees and shrubs. Fast, accurate detection without causing public concern, by the vegetation method.

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Effective methods of saving trees damaged by gas leaks, or by pipe construction and repairs, preventing spread of injury and often effecting full recovery, thus preventing and reducing damage claims.

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Detection of tree damage due to other causes than gas leaks or construction, and reports on this damage before operations saves heavy losses on false and mistaken claims.

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The savings in "unaccounted-for gas" and in damage claim prevention will more than pay for the survey bill. *The average cost per mile in 1939 was $1.44. Write for "Check-Up," a descriptive booklet, and for the statements of gas utilities in many different states using our service.

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CURRENT Reading

Catalytic Dehydrogenation of Gaseous Paraffins — A. V. Grosse and V. N. Ipatieff. *Ind. and Engr. Chem.*, Feb., 1940, pp. 268-272. This process consists briefly in passing the preheated paraffin gasses over a suitable catalyst. The outgoing gasses contain olefins and hydrogen besides the unreacted original paraffins. The olefins are polymerized or used in alkylation, the hydrogen is separated, and the unreacted original paraffins are recycled. A description of the plant is given.

A New Method of Gas Analysis— W. J. Gooderham. *Jour. Soc. Chem. Ind.*, Transactions, Jan., 1940, pp. 1-8. Given a series of accurate gas meters, which do not appreciably absorb gas or cause loss of pressure, the simplest form of gas analysis can be obtained by passing gas through a meter, a reagent to remove completely one constituent of the gas, another meter, another reagent, another meter, and so on. Gas analysis then becomes a matter of reading gas meters. This paper describes how, by using soap films as gas meters, it has become possible to obtain simple and accurate gas analysis from stopwatch readings without the use of taps or mercury as integral parts of the measuring apparatus. Using diaphragm pumps, a new form of gas holder made of corrugated metal rings and a special type of governor, average gas samples can be readily collected, stored under pressure, and analyzed.

The Compressibility of Gases — G. G. Brown and D. E. Holcomb. *Petroleum Engineer*, Feb., 1940, pp. 23-26. Part 2. Gaseous Mixtures. Part 1 in January issue, p. 21.

A Pistol that Sprays Powdered Metals and Plastics — R. G. Skerrett. *Compressed Air Magazine*, Jan., 1940, pp. 6057-6060. Metal spraying has become important in recent years for protecting metal surfaces and also for building up worn metal parts to their original dimensions. This article describes a new piece of equipment that is designed primarily for spraying soft metals and plastics. It has been extensively used abroad and is now being introduced in this country.

Fuel-Flue Gases — Advisory Committee, Technical Section, American Gas Association. $2.50 to A. G. A. members, $5.00 to non-members. The purpose of this book is to bridge the gap between the work of the chemist engaged in analytical investigation and that of the engineer and sales forces who are looking for the application and interpretation of the chemist's findings. Though interwoven with the chemistry of the gas industry, this book is not of the chemist nor should it require chemical training to make it useful. It should be useful in referring to the basic laws of behavior of gases which are covered in the introduction, or it should be of help in interpreting the complex composition of natural, mixed, and manufactured gases. In addition to the introduction, the book is divided into nine chapters. The first five chapters deal largely with fuel gases, the sixth chapter with the chemistry of the distribution system and its problems, and the seventh chapter with atmospheres other than those composed of combustion products. The last two chapters deal particularly with gases which result from the combustion of industrial fuels and fuel gases.

■ ■

Employment Regularization — National Association of Manufacturers, 14 West 49th St., New York City. Thirty-five tested procedures for stabilizing employment in industry, successfully utilized in the four broad fields of production, distribution, personnel and management activity, are analyzed in this survey report made by the National Association of Manufacturers as a part of industry's nation-wide efforts to regularize employment wherever possible. For the guidance of manufacturers, the report contains, as well, a compilation of 68 "case histories" of individual companies which present in detail practical experiences with employment stabilization and the degree of success accomplished. The study is the work of the N. A. M. Employment Relations Committee, A. W. Hawkes, of Kearny, N. J., chairman.

Industrial Design, A Practical Guide —Harold Van Doren. Published by McGraw Hill Book Publishing Co., 330 West 42nd Street, New York City. The book is divided into four sections. The first part surveys the field; the second concerns fundamentals and is an elementary treatise on designing in three dimensions; the third deals with the technique of design production; and the fourth offers various problems for the beginner, concluding with case histories describing the development of several products now on the market. Streamlining, fees, materials and processes, design patents, color technique, and suggestions for the operation of a free-lance studio are described in detail.

Human Relations Manual for Executives — Carl Heyel. Published by McGraw Hill Book Publishing Co., 330 West 42nd St., New York City, price $2. The book outlines successful procedures, selected from many industries, which will assist in analyzing problems in human relations. Application check points in the form of questions are listed at the end of each chapter to direct the thinking of the reader to his own situation.

High Temperature Cooling of Internal-Combustion Engines — *Petroleum Engineer*, Feb., 1940, pp. 83, 85. Within the last two years industrial interests in the development of motive power by the use of internal combustion engines fueled with regular metered city gas has grown so rapidly that recent reports made by the Gas Engine Power Committee, Industrial Gas Section, American Gas Association, concern-

ing better methods of waste heat utilization in connection with gas engine applications will be of profit-producing concern to power-using industries. The improved procedures involve what is known as "high-temperature cooling" of internal combusion engines, and are based upon the use of jacket cooling water at temperatures greater than 212° F.

TNEC Testimony—Published by the Bureau of National Affairs, Washington, D. C. The complete and verbatim testimony presented at the petroleum industry's hearings before the Temporary National Economic Committee has been compiled in three volumes, selling for $15. Tables, charts and exhibits are included.

Personnel—Guy W. Wadsworth, Jr. *Mechanical Engineering*, Jan., 1940. An article on personnel, written by the personnel manager of Southern California Gas Co.

Practical Application of Electrolysis Prevention on Pipe Lines and in Compressor Stations — P. F. Marx. *Petroleum Engineer*, Feb., 1940, pp. 51, etc. Part 2—Insulating ignition systems. Part 1 in January issue, p. 48.

Many Construction Problems Involved in Laying of New Gas Line—F. H. Love. *Petroleum Engineer*, Feb., 1940, pp. 87, 88, 90. Crossing of Mississippi River at Vicksburg, laying of pipe in swamps and in soil susceptible to corrosion, taxed ingenuity of United Gas Pipe Line Co.'s construction personnel in laying line from Monroe, Louisiana, to Jackson, Miss.

Graphic Method Facilitates Pipe Line Flow Calculations — G. H. McKay. *Petroleum Engineer*, Feb., 1940, pp. 99, 100, 102. During the initial discussions that precede the design of virtually every gas transportation system, a "quick" answer concerning line capacity may be desired in each of several proposed sets of flow conditions. Particularly when numerous input and discharge connections are involved, extended calculations for each combination may consume more time than is warranted for merely discussion purposes. As an aid to the engineer who must make these calculations, a series of charts may be prepared that will expidite the work materially. In this article, the author prepares such a chart, and demonstrates its use by the solution of an actual example.

Eliminating Underground Corrosion — C. W. Geiger. *Power Plant Engineering*, Feb., 1940, pp. 65-66. Describes methods and equipment used to combat underground corrosion of pipe lines on Treasure Island, San Francisco.

Deviation of Natural Gas at High Pressures — Useful Charts on Gas Behavior —J. W. Smith. *California Oil World*, 1st Feb., 1940, pp. 12-15. Correlation of the deviation of pure hydrocarbons with the critical point; Correlation of the deviation of mixtures with the pseudo-critical point; The deviation of an actual gas; Effect of condensation; Accuracy of the pseudo-critical method; Partial volume method.

Internal Combustion Engines Used in California Deep Drilling — W. A. Sawdon. *Petroleum Engineer*, Feb., 1940, pp. 173, etc. Well at Wheeler Ridge, drilled to a depth of 11,168 ft., is deepest test ever drilled by internal combustion engine; 900 ft. 12¼-in. hole in six hours in an East Montebello field well is example of speed attained.

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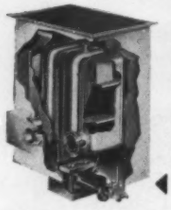

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Chicago Utility Introduces "Certified Quality" For Winter Air Conditioners

A program of "Certified Quality" (abbreviated "CQ") has recently been introduced by the Peoples Gas Light and Coke Co., Chicago, governing the standards for gas winter air conditioning systems and the installation of such equipment.

According to Blaine A. Johnson, sales engineering manager, the main objective of the "CQ" program is to give the home owner added assurance of satisfactory winter air conditioning service, and to preserve and strengthen the present acceptance of gas winter air conditioning equipment in an expanding market.

To be eligible for Certified Quality classification, the manufacturer's equipment must not only have been approved by the American Gas Association and the People's Gas Light and Coke Co., but also must deliver specified degrees of controlled heat, air circulation, humidification and air filtering, and meet specifications for unit efficiency and capacity, burner construction, certain design of combustion chambers and heat exchangers, and requirements for valves, pilots, motors, blowers, filters, cabinets, controls and flues. Electric wiring, as part of the equipment, must be standard, and an acceptable wiring diagram must be prominently displayed. The manufacturer must also furnish assembly instructions and an acceptable guarantee covering the equipment.

As applied to installation procedure, CQ means that specifications now recognized by architects, builders and contractors in such organizations as Warm Air Heating Association and the American Society of Heating and Ventilating Engineers are fulfilled, as well as new CQ requirements covering the air distribution system, controls, heating units, flue connections, electrical wiring, gas and water piping and the contractors' guarantee as to the fulfillment of the specifications.

Under the CQ plan, the heating contractor gives the owner of the home in which the equipment is to be installed a certificate of "Certified Quality," prepared by the Peoples Gas Light and Coke Co., which tells him in simple, non-technical language exactly the type of equipment to be furnished, how it will be installed, and the kind of winter air conditioning results it will deliver after it is installed. In carryng out this program, the Peoples Gas Co. has also prepared material giving full information regarding the new equipment and installation standards for manufacturers, architects, builders and heating contractors.

■ ■

Industrial Gas Division of N.E.G.A. Holds Meeting

A meeting of the Industrial Gas Division of the New England Gas Association was held March 8 at the Hotel Stratfield, Bridgeport, Conn. Cecil C. Ogren, Boston Consolidated Gas Co., and 1939 chairman of the division, presided at both the luncheon and the business session. Following the election of the new chairman, Ralph D. Hawkins, the Bridgeport (Conn.) Gas Light Co., papers were delivered by J. A. Comstock, Surface Combustion Corp., Toledo, Ohio; Herman Koester, W. Wirt Young Co., Watertown, Conn. (for W. Wirt Young, absent); and Harry W. Smith, Jr., director of Industrial Publicity, American Gas Association, New York.

The program also included a visit, led by Ralph D. Hawkins, to the Singer Sewing Machine Co. plant in Bridgeport for the inspection of the heat treatment given small sewing machine parts. Following the meeting, delegates attended the display of industrial gas-burning equipment sponsored by the Bridgeport Tool Engineers Association, Inc., at the State Armory in that city.

■ ■

New Local Gas Wells May Serve Indiana Towns

Franchises for natural gas service are being sought by the Indiana Consolidated Oil & Gas Co., Bloomfield, in the towns of Worthington and Bloomfield. The gas would be piped to the towns from wells drilled in Greene County, Ind., by the Wilson Drilling Co., of Robinson, Ill. Newly developed gas fields in and around Greene county are expected to produce natural gas in quantities sufficient to furnish the needs of all the towns in the county, it has been reported by C. C. Hendren, president of the Indiana Consolidated Oil & Gas Co., Inc. Gas was first found in Indiana in 1900.

■ ■

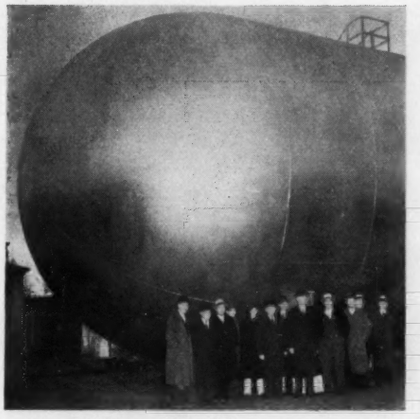
Firms Announce Joint Plant

El Paso Natural Gas Co., and Phillips Petroleum Co. have announced the construction of a joint natural gasoline plant. The companies plan to handle casing-head gas produced in the Langlie-Mattis areas, Lea County, N. M. The plant will have a capacity of treating about 92,000,000 cu. ft. of gas per day. Construction and operation of the plant will be in charge of El Paso Natural.

■ ■

United Gas Given Franchise

The United Gas Pipe Line Co., Houston, Texas, has been granted an ordinance to construct gas pipe lines, equipment, appurtenances under, along, across and over certain roadways, highways, streets and waters in Bossier, La.



Gas company executives and prominent citizens of Corvallis, Ore., inspect the gas holder recently completed by Portland Gas & Coke Co. The welded steel high-pressure holder has a capacity of 100,000 cubic feet.

Portland Gas & Coke Co. Completes New Holder

DISTINCTIVE in that it is the first of its kind to be built in the Pacific Northwest is the new 100,000 cu. ft. high-pressure gas storage holder recently completed by Portland Gas & Coke Co., Portland, Ore., at Corvallis, where Oregon State College is located. The holder was erected to take care of rapidly increasing popularity of gas service, together with growth of business in general in Corvallis, according to R. G. Barnett, vice-president and general manager. J. Fred Ehrke is the local agent.

Resembling a moored "blimp," it is a steel cylinder, 25 ft. in diameter and 58 ft. long, with spherical ends, resting on a concrete foundation. Sixty-two tons of steel plates, each 7/8 in. thick and weighing approximately three tons, were welded together to form the rigid shell of steel.

Gas is pumped through more than 90 miles of steel gas mains from Portland Gas & Coke Co.'s chemical and manufacturing plant. The holder is finished with aluminum paint. White compressor house, modern fence and shrubbery improve its appearance.

■ ■

Canadian Gas and Electric Industries Entertained

A dinner sponsored by the British Columbia Electric Railway Co., Vancouver, B. C., for the Canadian electric and gas industries, was given February 27 at the Hotel Vancouver, and was attended by more than 750 representatives of utility, manufacturing, jobbing, contracting and dealer organizations.

W. C. Mainwaring, manager, sales department, presided at the after-dinner program. Featured speakers were W. G. Murrin, president, and E. H. Adams, vice president. The main event of the program was the "Cavalcade of Progress," an illustrated commentary on the cooperative sales plan for the year.

■ ■

Oklahoma Natural Remodels

Officials and employes of the Oklahoma Natural Gas Co. began transacting business March 1 in the company's new building in Sapulpa, Okla. The utility occupies the old location of the former Sapulpa Gas Co., but the building has been completely remodeled and redecorated.

Does Your Company Make these Mistakes in Advertising?

Do you permit your business paper advertising merely to "keep your name before the trade"?
It can easily be made to carry a real sales load.
Are you afraid to run long copy about your product or service?
If your ad is of genuine interest to business paper readers, they'll eat it up!
Do you try to make each ad appeal to everybody?
Aim your ads specifically at those who can buy, give them interesting facts, and they'll act!

"TELL ALL" has been compiled by the Associated Business Papers for the sole purpose of helping advertisers get a bigger money's worth from the space they buy.

The simple, logical manner in which a host of advertisers have corrected these common mistakes — to their everlasting profit — is described in the free book "TELL ALL . . . A Practical Guide to Successful Business Paper Advertising". It contains no magic formula for *copywriting*. That isn't management's job. But it does describe the important factors that should go *into* advertising that is expected to pay its way.

In addition to illustrating a wide variety of applications of these simple but important elements, "TELL ALL" shows how some advertisers have measured the effectiveness of their business paper advertising to produce the kind of evidence of advertising worth that management is entitled to.

If you want to help your advertising department or agency to do the kind of a business paper job that really sells goods, send for your free copy of "TELL ALL" today.

GAS, the Natural Gas Magazine,
1709 West Eighth Street,
Los Angeles, California.

As long as there is no obligation, I'm gambling a postage stamp on the chance of getting a good idea or two from TELL ALL. Send my copy.

Name.....
Position.....
Company.....
Street.....
City and State.....

GAS—The Natural Gas Magazine

Highest editorial standards and publishing integrity. HBP Member of the Associated Business Papers ABC Proved reader interest in terms of paid circulation.

10★HEATING

FRASER

W·A·C

★ FIRE BOX—Armco iron—faster, uniform heating.
★ SECONDARY RADIATION—Long travel plus heat trap.
★ BLOWER—Large volume, slow speed, quiet.
★ MOTOR—Full power—no overloading.
★ RUBBBER MOUNTINGS—Stop vibration and noise.
★ BEARING—Bronze, graphite feed type.
★ MOTOR DRIVE—Adjustable—fan speed changed quickly.
★ PRESSURE REGULATOR — Assures even gas flow to burner.
★ FAN AND LIMIT CONTROL—Automatic, by bonnet temperature.
★ INSIDE INSULATOR — Noiseless—Keeps shell cool.

It's the *inside* of the furnace *that counts.*

Sell carefree, customer satisfaction

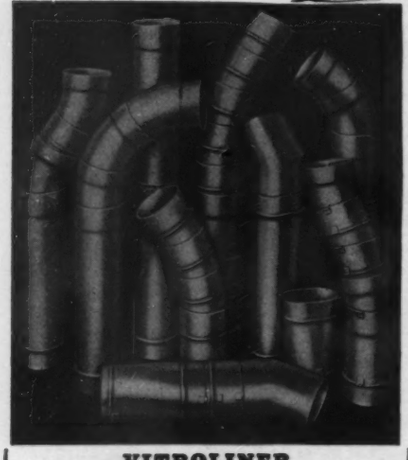
H. R. Basford Co. Distributors San Francisco Los Angeles

Fraser Furnace Co. Manufacturers Stockton, California

FRASER

GAS HEATING EQUIPMENT

ELIMINATE CONDENSATION TROUBLE



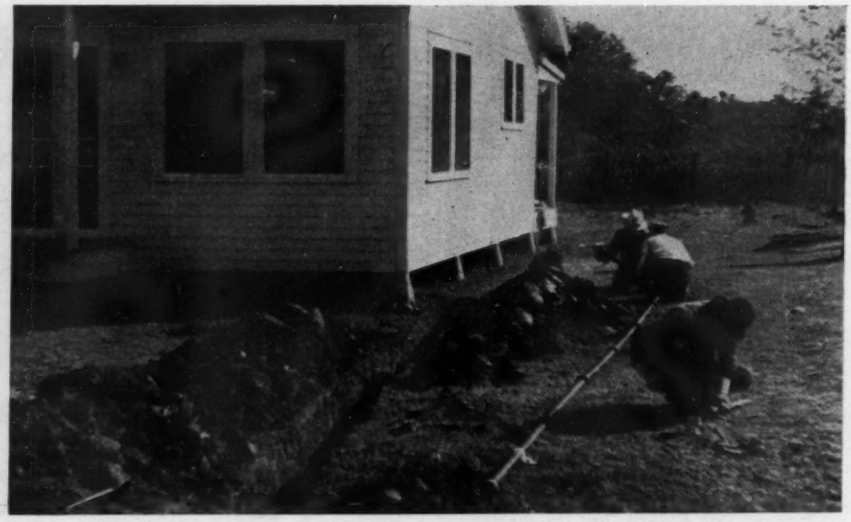
VITROLINER

—the permanent chimney lining that totally eliminates chimney deterioration caused by acid-bearing moisture deposited by all types of fuel. Made of Armco Ingot Iron, vitreous enameled both inside and out.

Also manufacturers of Condensation Eliminator and Howle Heat Extractor. Write for free condensation folder and price list.

CONDENSATION ENGINEERING CORPORATION

2515 Archer Avenue - - Chicago, Illinois



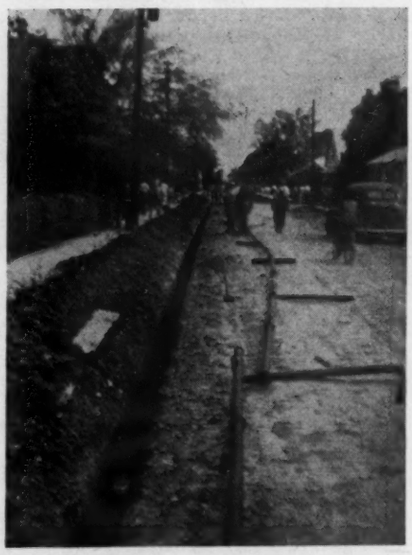
Laying a 1¼-in. service line from Houma, La.'s new gas distribution system.

Houma Completes Distribution System

A MUNICIPAL gas distribution system has recently been completed at Houma, La., a town of about 12,000 population, situated 50 miles southwest of New Orleans, in the Mississippi River delta. The system will service from 1500 to 2500 meters with natural gas, according to T. Baker Smith, city engineer.

Brown & Root of Houston, Texas, were the contractors on the job, which included the laying of 4400 ft. of 6-in., 60,000 ft. of 4-in., 165,000 ft. of 2-in., and 70,000 ft. of 1¼-in. cast iron pipe. The 4- and 6-in. pipe and fittings were supplied by National Cast Iron Pipe Co. and equipped with Carson mechanical joints. The 1¼- and 2-in. pipe was equipped with McWane threaded joints with Carson Cadillac fittings used on all service connections. J. V. Bell, superintendent of Brown & Root, stated that the two small crews of common laborers laid, on some days, as much as 7000 ft. of cast iron pipe.

The Houma system was financed by the sale of municipal revenue bonds totalling $250,000, and payable in 15 years at 4% interest from the earnings of the system. The city will repay $9000 of the principal in 1941, $11,000 in 1942, $13,000 in 1943, $15,000 in 1944 and thereafter will increase the payment by $1000 each year through 1954. The bonds may be redeemed in inverse order with surplus revenue from the system, and the city hopes to retire the entire issue in about 11 years. Bonds amounting to $25,000 were retired immediately. Watkins, Morrow & Co., investment brokers, Birmingham, Ala., handled the issue. According to Mr. Smith, yearly revenue from the system will be approximately $40,000. The domestic rate is $1 monthly minimum and 65 cents per M c.f. thereafter.



Laying 2-in. mechanical joint cast iron pipe for the gas distribution system at Houma, La.

Mayor Elward Wright headed the movement to construct the municipal system in Houma.

■ ■

Retired N. Y. Official Dies

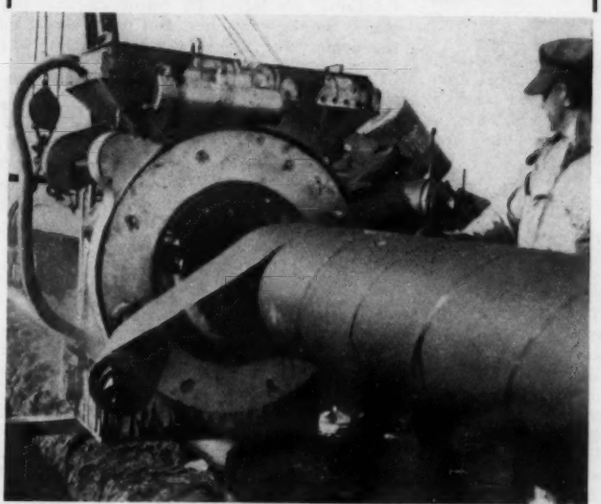
Joseph C. Collins, 76, retired treasurer and secretary of the Rochester Gas and Electric Corp., Rochester, N. Y., died recently at Miami, Fla. Mr. Collins joined the company in 1907 and retired in August, 1939, having been secretary of the company during his entire period of service, and treasurer since 1925.

MAKE

ONE JOB

OF

COATING AND WRAPPING...



With This NEW Johns-Manville Machine

You save both time and money when you use the J-M Machine shown here. It coats and wraps pipe in a single operation in the field . . . as fast as the line can be assembled. Application costs are considerably reduced. And for wrapping . . .

Asbestos Felt Gives LASTING Reinforcement

Strong and durable, J-M Asbestos Pipe-Line Felt effectively reinforces the coating against abrasion and distortion. Inorganic, non-tubular asbestos fibers prevent capillary action . . . cannot rot or decay. As a result, J-M Asbestos Felt assures efficient pipe-line service and continued low maintenance costs.

During the past 25 years, more than 30,000 miles of pipe have been protected underground with J-M Asbestos Felt. It will pay you to get full details on this lasting material, and complete information on the J-M Combination Coating and Wrapping Machine. Write for brochure D. S.-375, Johns-Manville, 22 E. 40th St., New York, N. Y.

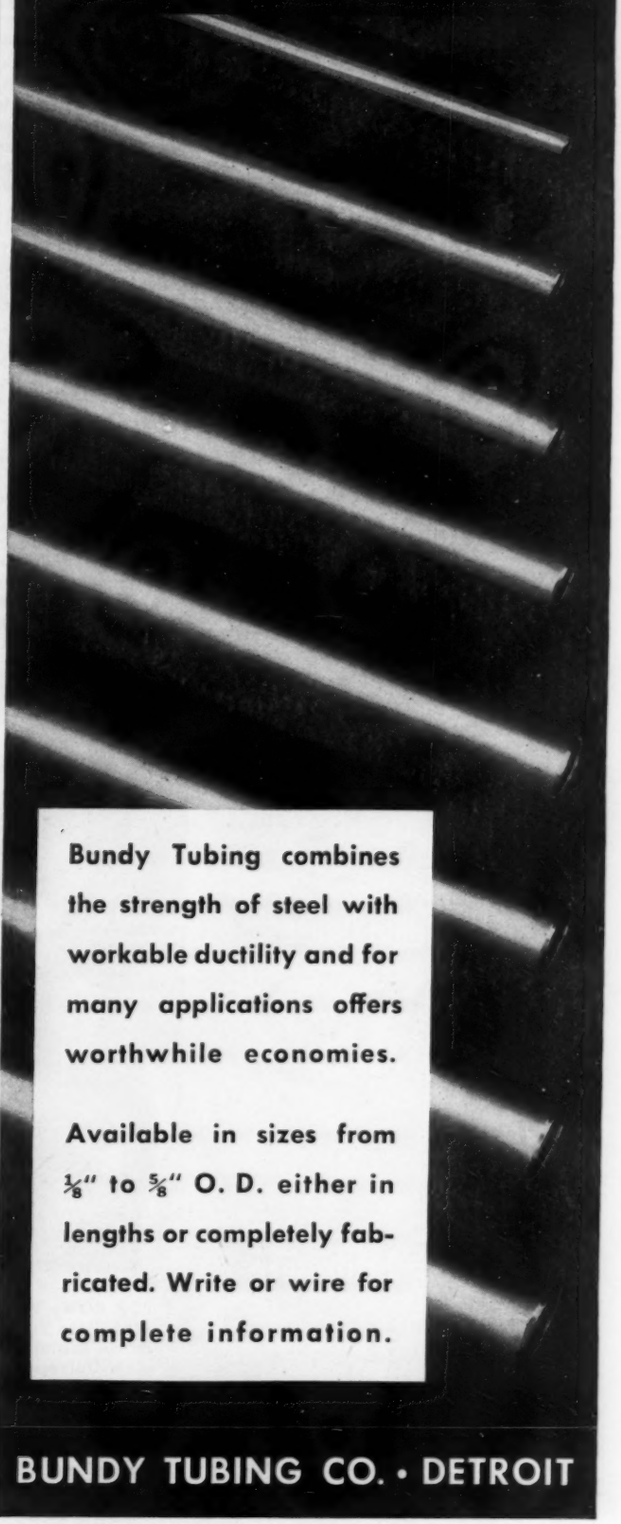
Johns-Manville

ASBESTOS PIPE-LINE FELTS

BUNDY TUBING

(COPPER COATED STEEL)

Offers Many Advantages in Gas Appliance Manufacture

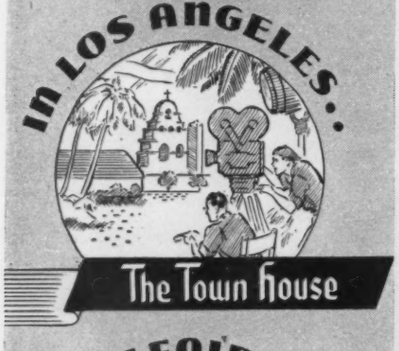


Bundy Tubing combines the strength of steel with workable ductility and for many applications offers worthwhile economies.

Available in sizes from ⅛" to ⅝" O. D. either in lengths or completely fabricated. Write or wire for complete information.

BUNDY TUBING CO. • DETROIT

YOUR GRACIOUS HOST FROM COAST TO COAST



A.S. KIRKEBY, *Managing Director*

KIRKEBY HOTELS

Spring Sales Promoted by Pacific Coast Companies

SPRING sales campaigns are being sponsored on the Pacific Coast by several utilities, it has been reported by the Pacific Coast Gas Association. The Portland Gas and Coke Co., Portland, Ore., is in the midst of a campaign for new customers and the reopening of dead services, with a quota set at 1500. The company's personnel is divided into teams or "parties" which campaign for the election of the "Governor of Gasco." New customers and reconnects secured are votes which are cast each week in a "primary election" for office within the party. The campaign will end April 27.

A water heater drive that will end April 30 is under way in the Southern California and Southern Counties Gas Companies, Los Angeles, featuring non-ferrous tank heaters. Featured at dealer meetings prior to the campaign was a slide-talkie entitled "Little Blue Flame and the Three Wolves," or "She Kept Them in Hot Water."

The Gas Appliance Society of Northern California finished its CP gas range campaign March 9, having advertised over 18 radio stations with spot announcements, in 100 movie theaters where color slides were shown, and in 250 newspapers.

■ ■

August Dates Set for West Virginia Meter School

At a meeting of the general committee held in Morgantown, W. Va., February 16 (see cut below), August 19, 20 and 21, were chosen for the third Appalachian Gas Measurement Short Course. In addition to selecting dates and formulating plans for this year's schools, the general committee established various sub-committees. Those appointed on these committees are: B. P. Stockwell, West Virginia Public Service Commission; W. A. Staab, West Virginia University; A. D. MacLean, Pittsburgh Equitable Meter Co.; J. W. Allison, Monongahela West Penn Public Service Co.; R. S. Reed, Jr., Pittsburgh Equitable Meter Co.; R. O. Borden, American Meter Co.; J. E. Overbeck, Columbian Engineering Corp.; A. K. Kraus, Peoples Natural Gas Co.; H. J. Wagner, Public Service Commission of West Virginia.

■ ■

American Stove Announces Spring Promotion Plans

THE American Stove Co. has announced its Spring 1940 promotion campaign, including plans for advertising and merchandising on Magic Chef Ranges. The promotion portfolio dramatizes cooking magic in terms of the Magic Chef character as a magician aided by an attractive girl. The book is a 32-page three-color portfolio, designed as a theater program, billing "The Wizard of Cookery" in four acts. "This year," says S. E. Little, vice president in charge of sales, "our campaign is built around the Wizard of Cookery, developed in terms of cooking-magic for the consumer, and profit-magic for the dealer, and makes a natural tie-up with our product name."

The first act introduces the new 1940 Magic Chef line; the second act outlines Magic Chef's national magazine campaign; the third act features Magic Chef's complete array of promotion material; and the fourth act stresses the part played by the local appliance merchandiser. Batten, Barton, Durstine & Osborn, Inc., Buffalo, is the agency handling the publicity.

■ ■

Canadian Firm Adopts CP

A second Canadian range manufacturing concern, Clare Bros., of Preston, Ontario, will participate in the international CP gas range program, it has been announced by the Association of Gas Appliance and Equipment Manufacturers. Clare Bros. have signed contracts for a license to sell CP ranges under the trade mark owned by the Association. Moffatt's, Ltd., Weston, Ontario, was the first Canadian manufacturer to join.

TOP ROW: W. A. Ehlers, Reynolds Gas Regulator Co.; J. W. Allison, Monongahela West Penn Public Service Co.; G. R. Spindler, West Virginia University, Morgantown; Edwin Robinson, West Virginia Oil & Natural Gas Association; W. A. Staab, West Virginia University, Morgantown; E. M. Lockwood, Sprague Meter Co.; SECOND ROW: C. B. Heist, Manufacturers Light & Heat Co.; A. F. Kraus, Peoples Natural Gas Co.; J. R. Sproat, Pittsburgh Equitable Meter Co.; H. J. Wagner, West Virginia Public Service Commission. FRONT ROW: R. O. Borden, American Meter Co.; R. W. Hitchman, United Fuel Gas Co.; Lawrence A. Hunter, Columbian Carbon Co.; Allen D. MacLean, Pittsburgh Equitable Meter Co.; G. W. Harr, Monongahela West Penn Public Service Co.; T. K. Spalding, Owens-Libbey-Owens Co.

JOHN ZINK BURNERS

AMAZING!

How simple, sturdy, efficient and low-priced . . .

JOHN ZINK FLOOR FURNACES
JOHN ZINK CONVERSION BURNERS

BUT . . . NOT SO AMAZING, AFTER ALL . . .

They are designed by a group of Engineers who know more about burning gas than any other group of Engineers in the world.

ANY GAS APPLIANCE IS ONLY AS GOOD AS ITS BURNER

"John Zink Burners Must Be Good"

JOHN ZINK COMPANY

Burners • Floor Furnaces • Unit Heaters

TULSA, OKLAHOMA NEW YORK CITY

HE'S DOING IT THE *Easy* WAY . . . . . .

Here, shown in the photograph, is the Greenlee No. 790 Hydraulic Pipe Pusher as set up by one contractor to install a 4-inch pipe under a paved street. With only a short trench on each side of the street it was possible to install the pipe without damaging the pavement or interfering with the traffic. He did it the easy way by doing it the Greenlee way!

And you can also save the time and cost of trenching and tearing up of lawns and pavements with the Greenlee pusher. Easy to set up and simple to operate, the Greenlee will do the job faster and cheaper for you. Write for facts on how you can save money on your pipe installations.

GREENLEE *Hydraulic* PIPE PUSHER

GREENLEE TOOL CO.

1700 Columbia Ave. Rockford, Ill.

VENT-A-HOOD . . . sensational new patented kitchen ventilator—NOT A FAN—grease trap and centrifugal exhaust unit removes cooking odors from kitchen before they can invade other parts of the house. Prevents greasy vapors from settling on walls —saves housework. Keeps kitchen cool. Biggest innovation since mechanical refrigeration.

Factory representatives and warehouse stocks now in following cities. Other territory open.
Kansas City . Zahner Mfg. Co., 1213 Walnut St.
St. Louis . . . . Russell Patton, 526 Vanderventer
Chicago . . . Royal A. Stemm, 21 E. Van Buren
Pittsburgh, Pa. . . T. C. Kersey. 2347 Manor Ave.

The VENTAHOOD Co.
2808 COMMERCE STREET
DALLAS. Dept. L TEXAS

● **In Los Angeles**
it's the
HOTEL CLARK
Fifth and Hill

555 Rooms-Baths

from $2.50 PER DAY

RIGHT downtown in the center of things. Easy chairs, sleep-inspiring beds, large rooms with luxurious fittings.

Famous for Good Food from Coast to Coast

P. G. B. MORRISS
Manager

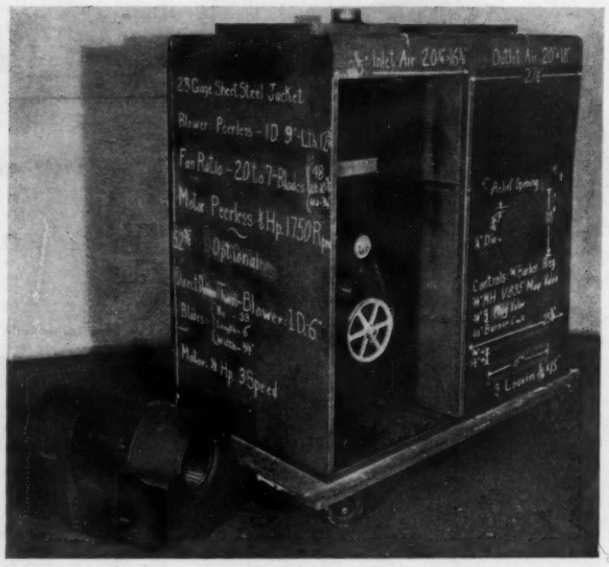

Inlet Air
Outlet Air
28 Gage Sheet Steel Jacket
Blower Peerless - ID 9"
Fan Ratio - 20 La 7 Blades
Motor Peerless ½ Hp 1750 R.P.M.
Optional
Direct Drive Twin Blower 10 D 6
Motor ½ Hp 3 Speed

FIG. 1. View of the American Gas Association Testing Laboratories Photographic Equipment

Photography—Now an Important Step In A.G.A. Laboratory Procedure

ONE of the most important steps in testing and approving or listing an appliance or accessory submitted for the American Gas Association Testing Laboratories' approval is the making of a complete description thereof for identification purposes. This description is then available for a permanent record and is frequently used by Laboratories' inspectors to ascertain whether production models are being made in exact conformity with models approved in the Laboratories. Until photography was recently introduced, making descriptions of appliances or accessories was the "bottle-neck" in testing activities. Preparation of detailed sketches for blue-printing of the various parts, as well as of the entire assembly when they could not be supplied by the manufacturer was necessarily time-consuming and, in some instances, required a considerable portion of time of our engineers in making the tests. With exception of cross-section views, they have been very successfully replaced with photographs.

In the Laboratories, the making of descriptive drawings slowed up testing activities and delayed return shipment of tested equipment to manufacturers. Photographs speed up the making of descriptions, as in most instances it is feasible to inscribe essential dimensions directly on the parts photographed. For such parts as burners, dimensions are inscribed on a paper background on which the burner is photographed. Fig. 1 illustrates the new method of making descriptions. By eliminating all drawing with exception of cross-sections, Laboratories' testing engineers are enabled to devote more time to actual test operations.

■ ■

ROBERT J. KUHN
Consulting Engineer
CATHODIC PROTECTION
Transmission Lines — City Networks
Electrolysis — Corrosion Surveys
Nationwide Service
1644 Canal Bank Bldg. New Orleans, La.

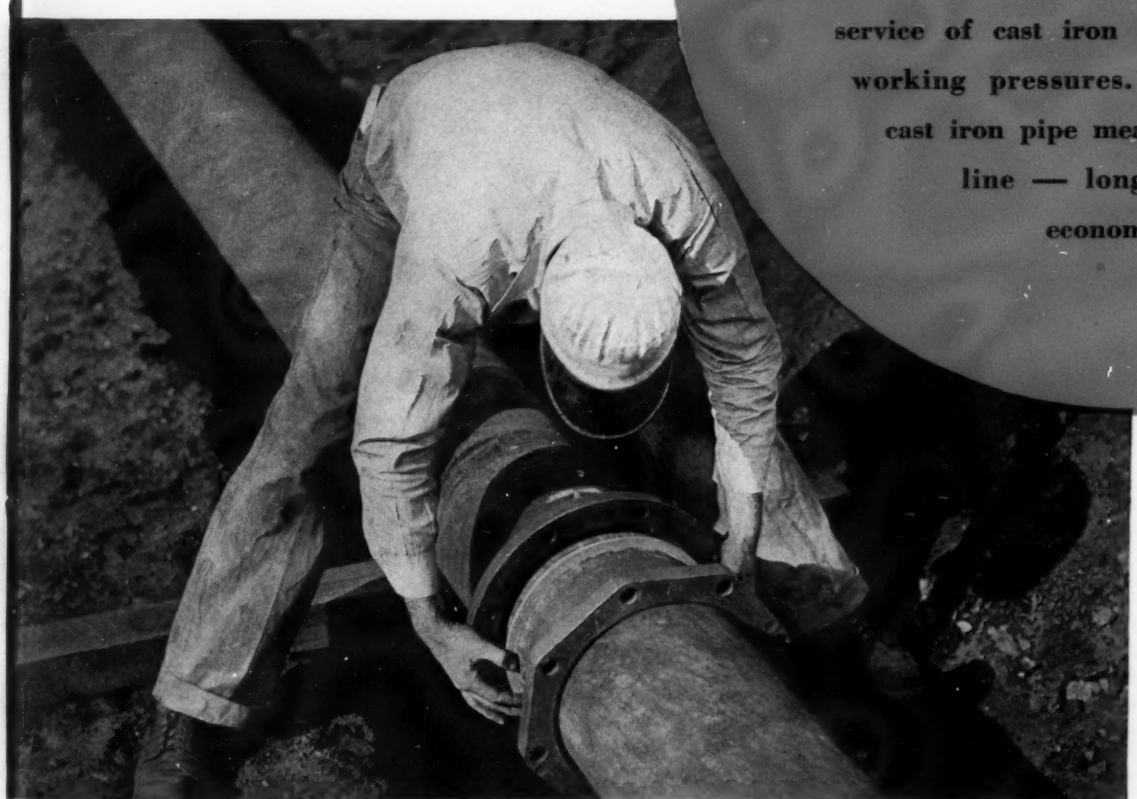
GEORGE A. BURRELL
Petroleum and Gas Engineer
Design—Construction—Reports
■
Suite 1909
20 Pine Street New York City
1936-42 5th Avenue Pittsburgh, Pa.

Indiana Gas Association Plans 1940 Convention

The Indiana Gas Association will hold its 30th annual convention at Evansville, Ind., May 13 and 14. The Southern Indiana Gas & Electric Co. is host for this year's meeting. The program committee consists of: F. B. Cully of the host company; H. G. Horstman, Public Service Company of Indiana, Indianapolis; C. V. Sorenson of Hammond, and G. R. Woehler of Evansville.

This cast iron gas main, recently uncovered in Philadelphia, has been in service for more than 100 years and is in prime condition—good for at least another century.

Cast iron pipe has benefited, of course, from improved metallurgy and production methods since distribution engineers laid cast iron gas mains a century ago. Yet these mains survive. The modern stuffing-box type mechanical joint, as developed by CIPRA members, still further improves the service of cast iron pipe under modern working pressures. Mechanical-joint cast iron pipe means a *bottle-tight* line — long-lived and economical.



Look for the "Q-Check" registered trade mark. Cast iron pipe is available in sizes from 1¼ to 84 inches.

A mechanical joint being assembled—one of several designs, identical in principle, made by our members—all bottle-tight under modern pressures.

THE CAST IRON PIPE RESEARCH ASSOCIATION, THOMAS F. WOLFE, RESEARCH ENGINEER, 1013 PEOPLES GAS BUILDING, CHICAGO, ILLINOIS

CAST IRON PIPE

THE STANDARD MATERIAL FOR UNDERGROUND MAINS

S implicity of construction.

P arts interchangeable.

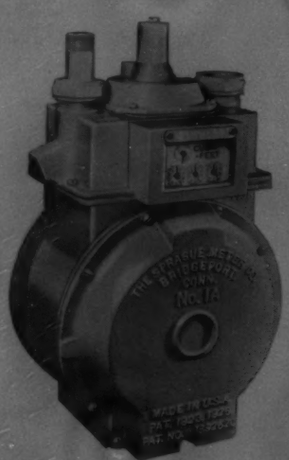
R educed operating costs.

A ccuracy in registration.

G ives satisfactory service.

U niform performance.

E fficient and dependable in manufactured, natural and Butane Gases.



THE SPRAGUE METER CO. BRIDGEPORT, CONN.